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STRAITS SETTLEMENTS

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By C. E. Carr 1

HERBARIUM
OF MYCOLOGY

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THE
GARDENS' BULLETIN
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Vol. V. 12th AUGUST, 1929. Nos. 1—2

SOME MALAYAN ORCHIDS.

By C. E. Carr.

Most of the species here described were collected in the State of Pahang. They include 21 new species and 5 species now recorded from the Peninsula for the first time. These latter are *Dendrobium fugax*, Schltr., *D. inconspicuiflorum*, J.J.S., *D. salaccense*, Lndl., *Eria Jagoriana*, Krzl., and *E. punctata*, J.J.S.

Bulbophyllum minimibulbum, Carr, *B. trichoglottis*, Ridl., *Eria Jagoriana*, Krzl., *E. punctata*, J.J.S., *Thrixspermum papillosum*, Carr, and *Sarcostoma javanica*, Bl., are montane, though the latter plant also occurs in the low country. *Bulbophyllum minimibulbum*, Carr, and *Thrixspermum papillosum*, Carr, are hitherto unrecorded, while both the species of *Eria* mentioned are new to the Peninsula.

The genus *Abdominea* was created by Dr. J. J. Smith to take a plant which appears to be the curious *Saccolabium minimiflorum*, Hook. f. This plant was originally recorded from Perak and later from Selangor at Batu Caves. It is now recorded from Pahang. A new genus *Ascochilopsis*, is here created for the distinct and interesting *Saccolabium myosurus*, Ridl. Two new species of *Chamaeanthus*, Schltr. are described. This genus has hitherto never been reported from the Peninsula.

The great majority of the plants dealt with come from the fluvial areas of the limestone district of central Pahang. The excessive humidity of these areas accounts for the relatively large number of species belonging to genera such as *Sarcochilus*, Br., *Chamaeanthus*, Schltr., and *Thrixspermum*, Lour. Far too little attention has been paid to these areas and I am convinced that further exploration will result in many new plants being brought to light.

Oberonia suborbicularis, sp. nov. Caules approximati, brevissimi. Folia c. 4, inarticulata, lineari-lanceolata, acuta, lateraliter compressa, falcate incurva, carnosa, intus super basin fissa, superiora maxima ad c. 6 cms. longa, c. ·80 cm. lata, grisei-viridia rubro-suffusa, saepe omnino rubra.

Inflorescentiae laxe multiflorae, folia paulo superantes, c. 6·5–7 cms. longae. Bracteae inferiores lanceolatae margine pauce crenatae, bracteae superiores oblique oblongo-lanceolatae acutae irregulariter marginatae et erosulae rubrae vel virides. Flores c. 8-verticillati, explanati trans petala c. ·15–·17 cm. lati et aequilongi. Sepalum dorsale oblongo-lanceolatum, obtusum, reflexum, roseum, c. ·07 cm. longum, c. ·03 cm. latum. Sepala lateralia late ovata, subacuta, e basi valde reflexa, ovario adpressa, rosea, c. ·07 cm. longa, c. ·06 cm. lata. Petala patentissima, suborbicularia, marginibus erosula, rosea, c. ·06 cm. longa et lata. Labellum 3-lobum, inter lobos laterales incrassatione carnosa et basi excavatione parva donatum, rubrum, explanatum trans lobos laterales c. ·09 cm. latum, basi usque apicem c. ·06 cm. longum; lobi laterales patentes, obcuneati, apici margine rotundato et eroso, margine antico apici leviter rotundato-dilatato; lobus intermedius cum lamina angulum rectum faciens, brevis, latus, subreniformis, vix transverse oblongus, irregulariter marginatus. Gynostemium apicem versus dilatatum, c. ·02 cm. longum, auriculis rectis, truncatis; rostellum triangulare, apici anguste obtusum; stigma magnum, transverse ovale. Anthera cucullata. Pollinia 4 ovalia. Capsula patentissima, subobpyriformis, breviter pedicellata, rubra.

Apparently allied to *O. stenophylla, Ridl.*, from which it differs in the larger flowers, the suborbicular petals, the shorter and broader midlobe of the lip, etc.

Rare. Pahang, Kuala Tembeling on a rubber tree, one plant only found.

Described from the growing plant.

Liparis tembelingensis, sp. nov. Pseudobulbi approximati, lateraliter compressi, internodiis 2, e latere visi ovato-oblongi, curvuli, longitudinaliter rugulosi, pallide virides, ad c. 6 cms. longi, basi c. 2 cms. lati, sectione transversa elliptici, internodio superiore brevissimo quam apicem inferioris multo angustiore cum inferiore angulum obtusissimum faciente ad ·75–1 cm. longo. Folia erecto-patentia, 2, articulata, tenuiter coriacea, lineari-oblanceolata, acuta, apici decurva superiore quam inferius paulo majore subaequanteve, intus obtusangulariter concava, viridia, superiore ad 20 cms. longo, c. 2·80 cms. lato. Inflorescentiae ex apice pseudobulbi maturi exeuntes, pendulae, vix ad basin laxe multiflorae, quam folia paulo longiores aut subaequantes, basi vaginula lanceolata acuta donatae, pallide virides, c. 25 cms. longae. Bracteae pedicello adpressae, triangulari-ovatae, longe acuminatae, acutissimae, intus concavae, extus convexae, pallide virides, c. ·31 cm. longae, c. ·13 cm. latae. Flores quaquaversi, patentissimi sepalis

petalisque valde reflexis roseis basin versus pallidioribus. Sepalum dorsale oblongum, obtusum, marginibus leviter recurvis, intus convexum, extus concavum, c. ·33 cm. longum, c. ·13 cm. latum. Sepala lateralia late oblonga, subacuta vel obtusa, marginibus leviter recurvis, intus convexa rare papillosa, extus concava, c. ·31 cm. longa, c. ·17 cm. lata. Petala linearia vel lineari-lanceolata, obtusa vel subacuta, marginibus leviter recurvis, intus convexa, extus concava, c. ·31 cm. longa, c. ·07 cm. lata. Labellum oblongum, dimidio inferiore erectum cum gynostemio angulum acutum faciente alte canaliculato-concavo lamina utrinque convexa basi tubercula parvula rotundato-conica obtusa utrinque sub medio dilatato roseo, dimidio superiore basi angustato abrupte decurvo canaliculato canalicula ad summam decrescente lamina utrinque convexa apici alte bilobo lobulis oblongis apici truncatis saepe denticulatis marginibus ciliatis c. ·10 cm. longis c. ·06 cm. latis, rubro, totum explanatum c. ·35 cm. longum, medio c. ·20 cm. latum. Gynostemium erectum, subsigmoideum, apici incurvum truncatum, basi et stigma prope dilatatum, albidum, c. ·20 cm. longum, alis transverse triangularibus obtusis, clinandrio concavo, rostello in rostrum triangulare acutum decurvum exeunte, stigmate excavato transverse elliptico. Anthera ovata, acuminata, obtusa, vix truncata, medio elevata oblongo-elliptica longitudinaliter sulcata, viridis, marginibus apiceque alba. Pollinia 4, dilute flava. Ovarium cum pedicello c. ·70 cm. longum. Capsula sexangulariter cylindrica, curvula, costis 6 conspicue elevatis, c. 1·50 cms. longa, c. ·50 cm. diam., pedicello c. ·60 cm. longo.

This belongs to the section *Coriifoliae* and is related to *L. parviflora, Lndl.* The colour of the flowers is however quite different.

Described from a living plant collected and cultivated at Tembeling Pahang. Flowered in November, 1928.

Dendrobium (§ *Bolbodium*) **quadrangulare,** *Parish mss.* Rhizome short, creeping, up to 2·50 cms. long, freely rooting, often interlacing and forming dense mats. Stems approximate of about 4 internodes, up to about 10 cms. long, yellow or yellow-green, internodes thickened upwards from a narrow base, upper one much thicker, four-angled, up to about 5·50 cms. long, ·60 cm. wide, sides often concave, a black ring at the apex. Leaves 2 at the apex of the stem, oblong-lanceolate or oblong elliptic, emarginate, coriaceous, base narrowed to a very small petiole, light green, margins often decurved, above convex on each side of the sulcate midrib, lower one up to about 4·25 cms. long, 1·25 cms. wide at the widest point, petiole about ·10 cm. long. Racemes several from tufts of dry bracts between the leaves. Flowers one from each tuft of bracts, pale yellow, about 1·50 to 2

cms. long, widely expanded. Upper sepal ovate, shortly acuminate, apiculate, 5-nerved, up to about ·70 cm. long, ·30 cm. wide at the widest point, lateral sepals broadly triangular-ovate, shortly acuminate, apiculate, 5-nerved, posterior margin up to about ·70 cm. long, anterior margin including the mentum up to about 1·75 cms. long, about ·55 cm. wide at base, mentum long, slightly incurved, narrowed to the narrowly linear, blunt, apex. Petals lanceolate acute 3-nerved up to about ·66 cm. long, ·17 cm. wide at the widest point. Lip rather obscurely 3-lobed, clawed, with 5 main nerves and 1 extra one on each side close to the margin near the base, nerves branched, 2 low keels along the centre of the blade raised near the centre to 2 low longitudinally triangular lamellae; side lobes very short, oblong, apex rotundate slightly erose, midlobe short, broad, rounded, with a low triangular-ovate cushion with a low horse-shoe-shaped, ochre-green, callus at its base, the whole up to about 1·50 cms. long, ·80 cm. wide across the side lobes, claw about ·20 cm. long. Column linear-oblong, foot slightly incurved, with a longitudinal central raised costa ending at the base in a globular, verrucous, dull orange callus, the whole up to about 1·60 cms. long, ·40 cm. wide, arms dilate upwards, apex truncate, 2–3 dentate, rostellum oblong, truncate, convex above. Anther quadrate, apex denticulate.

Pahang, Kuala Lipis, Kuala Tembeling, etc., very common.

This species is very nearly allied to *D. pumilum, Roxb.*, from which it differs in colour, the narrower, more acuminate mentum, the four-angled stems, etc. There is a variety of *D. pumilum, Roxb.*, without purple veins but even then the margins of the lip are usually purple. It is significant that the flowering frequencies of this species and of *D. pumilum* rarely, if ever, coincide.

Cultivated in the Botanic Gardens, Singapore.

Dendrobium (§ *Aporum*) **quadrilobatum,** sp. nov. Rhizoma breve, repens. Caules approximati, biseriales, e basi dilatati, facie antico et postico valde compressi, nitide flavo-virescentes, basi excepto omnino foliiferi, basi nonnullis vaginis tubulosis lateraliter compressis tecti, ad 30 cms. longi, internodiis e basi apicem versus oblique cuneato-dilatatis longitudinaliter multi-sulcatis, c. ·70–1 cm. longis, ·50–·60 cm. latis. Folia articulata, valde lateraliter compressa, falcate oblongo-triangularia, acutissima, crasse coriacea, viridia saepe purpureo-suffusa, e basi folio decimo fere maximo, foliis inferioribus et superioribus minoribus, ad c. 2–2·5 cms. longa, ·75–1 cm. lata, vaginis tubulosis lateraliter compressis. Inflorescentiae terminales squamis siccis tectae, brevissimae 1-florae. Flores valde patentes,

c. 1·1 cm. lati. Sepalum dorsale late oblongo-ovatum, apici obtus angulariter incurvum, abrupte acutum, dorso carina brevi elevatum, intus sub apice convexum, pallide flavescens, apice excepto nonnullis striis longitudinalibus et maculis purpureis, 5-nervium, c. ·48 cm. longum, c. ·45 cm. latum. Sepala lateralia gynostemii pedi adnata, oblongo-ovata, apicem versus obtusangulariter incurva, apici obtusa, 7-nervia flavescentia dimidio postico nonnullis striis roseo-purpureis, c. ·48 cm. longa, c. ·45 cm. lata, mento oblongo apici leviter dilatato obtuso pallide flavescente nonnullis maculis purpureis ornato. Petala tenuia, oblanceolata, leviter inaequaliter marginata, marginibus et apici denticulata, 3-nervia semipellucide pallide flavescentia, nonnullis striis roseo-purpureis ornata, c. ·45 cm. longa, c. ·25 cm. lata. Labellum apici pedis gynostemii adnatum, 3-lobum, unguiculatum, basi erectum sulco transverso donatum, lamina lineari-oblonga papillosa longitudinaliter sulcata purpurea, in sulca costa longitudinali brevi in callis 2 lamelliformibus brevibus oblongis papillosis apici rotundatis aurantiacis inter lobos laterales terminante, explanatum c. ·75 cm. longum, trans lobos laterales c. ·75 cm. latum. Lobi laterales erecti, oblongi, papillosi, apici rotundati, pallide flavescentes margine postico purpureo, c. ·27 cm. longi, c. ·25 cm. lati. Lobus intermedius e basi abrupte reflexus, bilobus, lobulis suborbicularibus flavis, papillosus, marginibus denticulatus, pallide flavescens, sinu inter lobulos minute purpureo-maculato, c. ·20 cm. longus, lobulis c. ·25 cm. latis, ungue brevi oblongo rotundate erecto. Gynostemium breve, rectum, albidum purpureo-suffusum, c. ·20 cm. longum, c. ·27 cm. latum, dorso apici leviter rotundate productum, alis latis; clinandrium transverse oblongum, profunde conico-excavatum. Anthera cucullata, facie antico leviter concava, apici late retusa et ciliata, albida purpureo-maculata et suffusa. Pollinia 4 flava, anguste obovata, subtus compressa. Pes gynostemii linearis, apici incurvus, roseo-purpureus. Ovarium cum pedicello c. ·80 cm. longum.

This is of the same affinity as *D. indivisum, Miq.*, and *D. lobatum, Miq.*

Pahang, Tahan river, growing together with *D. rhodostele, Ridl.*, on a tree overhanging the river.

Described from a living plant cultivated at Tembeling, Pahang.

Dendrobium (§ *Rhopalanthe*) **fugax**, *Schltr., in Bull. Herb. Boiss. Ser. 2, VI (1906) 455; J. J. S. in Bull. Dep. Agr. Ind. Neerl. 43 (1910) p. 45; D. Blumei, J.J.S. (not of Lndl.) in Fl. Buit. VI (1905) 329; Atlas (1908) CCXLVIII.*

Dr. J. J. Smith has a good figure of this under *D. Blumei, Lndl.* in his *Atlas (1908), No. CCXLVIII.* The plant has been confused with *D. planibulbe, Lndl.* from

which, however, it is at once distinguished by the longer pseudobulb-like swelling of the basal internodes of the stem, the much more spreading sepals and petals, and the midlobe of the lip which is quite different. Schlechter described it from plants taken by him at Sungei Lalah in the Indragiri district of Sumatra. According to Dr. J. J. Smith the species has not been reported from Java.

Cultivated in the Botanic Gardens, Singapore, and at Tembeling, Pahang.

Dendrobium (§ *Rhopalanthe*) **setifolium** *Ridl. in Journ. Linn. Soc. XXXI, 270; D. gracile, Ridl. Mat. I, 47; Fl. Mal. Pen. IV, 41.*

According to Dr. J. J. Smith's description of *D. gracile, Lndl.* in *Bull. Jard. Bot. Buit. Sér. 2, XXVI (1918) 37* in which he mentions some of Blume's original plants, and his figure in *Bull. Jard. Bot. Buit. Sér. 3, VI (1924) t. 14, f. 4* the plants in the Singapore herbarium labelled *D. gracile, Lndl.* are not referable to Blume's original species. They should be placed therefore under the name *D. setifolium, Ridl.*

There appear to be in Singapore no examples of *D. gracile, Lndl.*

Dendrobium (§ *Grastidium*) **salaccense,** *Lndl. Gen. and Sp. Orch. 86; Miq. Fl. Ind. Bat. III, 635; J.J.S. in Fl. Buit. VI, 348; Atlas (1908) CCLXIV; D. intermedium, T. and B. Nat. Tijdsche. Ned. Ind. V (1853) 490; Rchb. f. Walp. Ann. VI, 288; D. gemellum, Ridl. (not of Lndl.) Journ. Linn. Soc. XXXII, 252; Grastidium salaccense, Bl. Bijdr. 355; Callista salaccensis, O. K. Rev. Gen. Pl. II, 655; C. intermedia, O. K. l.c.*

In the Singapore herbarium specimens of this plant and of *D. inconspicuiflorum, J.J.S.* are both included under the name *D. gemellum Lndl.* The plants collected at Serangoon by Ridley in 1892; at Bukit Hitam, Selangor, by Kelsall, No. 8408 collected by Mohammed Haniff on the Teku river, Pahang, on June 21st, 1922; and those collected by Dr. Keith in Lower Siam on May 12th, 1890 (No. 354); are referable to *D. salaccense, Lndl.* There are in Singapore no examples of *D. gemellum Lndl.*, of which Dr. J. J. Smith has a figure in *Atlas (1908) No. CCLXXVI.*

Cultivated at the Botanic Gardens, Singapore, and at Tembeling, Pahang.

Dendrobium (*Grastidium*) **inconspicuiflorum,** *J.J.S. in Bull. Jard. Bot. Buit. Sér. 2, XXV (1917) 42.*

In the Singapore herbarium this species has long been confused, owing presumably to the absence of flowers, with

the more robust *D. salaccense, Lndl.*, both being included under the name *D. gemellum, Lndl.*

The plants in the Singapore herbarium collected by Ridley at Ayer Panas, Malacca, in 1893 (No. 1571); those collected by Seimund at Pulau Jarak in April 1921 (No. 65); by Hume at Rantau Panjang on June 4th, 1921 (No. 7593); and by Ridley at Taiping in 1892 are referable to this species. Only one example of the flower exists in the Singapore herbarium and that in indifferent condition.

Schlechter in *Engl. Bot. Jahrb., XIV, Beibl., 104 (1911)* described from Sumatra a plant much resembling the above but stated "*Wiewohl ich von dieser Art Hunderte von Exemplaren gesehen, fand ich nicht eine blute an denselben, die nicht pelorial umgebildet war.*" Dr. J. J. Smith was unable to observe any such pelorial development in his plants nor do I find it in the many Malayan examples seen by me.

Cultivated in the Botanic Gardens, Singapore, and at Tembeling, Pahang.

The longitudinal fascia of the lip mentioned by Dr. J. J. Smith is a wide orange ridge in which are embedded the three main nerves. These are continued beyond the apex of the ridge, the middle one to the apex of the lip, the outer ones, from which several branches radiate, to below the apex where they are abruptly and acute-angularly recurved outwards. In addition to these three nerves there is one extra on each side with one or more branches. The side lobes are inconspicuous in Malayan plants.

Bulbophyllum (§ *Epicrianthes*) **mobilifilum,** sp. nov. Rhizoma pendulum, vaginis membraneis tectum, ramosum, ad 50 cm. longum, c. ·18 cm. diam., radicibus basilaribus ad substratum superioribus ad rhizoma adpressis, internodiis c. 1·3–1·6 cms. longis. Pseudobulbi biseriales, 1·3–1·6 cms. dissiti, 1-folii, oblongi, penduli, cum rhizomate angulum acutum facientes, superne et subtus compressi, apici leviter curvuli, truncati, valde excavati, conspicue quadrilaterales lateribus concavis, pseudobulbis novis vaginis membraneis tectis, sordide flavescenti-virides, saepe rubro-suffusi, c. 1·5 cms. longi, c. ·50 cm. lati, c. ·35 cm. crassi. Folium pendulum aut porrectum crassiuscule coriaceum, oblongum aut oblongo-ellipticum, obtusum aut subobtusum, basi tortum et ad petiolum brevissimum angustatum, intus utraque sulcae mediae parte convexum, subtus utraque costae mediae inconspicuae parte concavum, sordide flavescenti-viride, 3·5–5 cms. longum, c. 1·5–2 cms. latum. Inflorescentiae fasciculatae basi pseudobulbi vaginis membraneis tectae, 1-florae, intervallis gignentes, pedunculo e basi apicem versus

dilatato furfuraceo basi nonnullis vaginulis tubulosis, c. ·38 cm. longo. Bractea tubulosa, furfuracea, apicem versus patens, late triangularis, mucronata, intus profunde concava. Sepala e basi valde reflexa, carnosa, extus sordide viridi-ochrea, intus nitidula omnino atrorubro-suffusa. Sepalum dorsale lanceolatum, apici brevissime angustatum, acutum, intus leviter convexum, extus leviter concavum, furfuraceum, 5-nervium, marginibus incurvum attenuatum angulatum, bene 1 cm. longum, c. ·37 cm. latum. Sepala lateralia lineari-oblonga, sub apice angustata, apici acuta, marginibus angulate incurva et attenuata, 5-nervia, intus leviter convexa, extus leviter concava furfuracea, bene 1 cm. longa, ·38 cm. lata. Petala ad pedem gynostemii decurrentia, brevissima et latissima, 2-loba lobis obtusangulariter divergentibus falcate curvis triangulari-ovatis acuminatis albis dimidio superiore roseis; lobus posticus apici decurvus, margine antico sub apice appendices 3 dense grisei-papillosas rectas lineares teretes exterius decrescentes inaequimagnas 1-nervias basi longe pedicellatas ferens, appendicibus ad ·50 cm. longis, pedicellis c. ·10 cm. longis; lobus anticus apici decurvus, appendices 3–4 similes ferens, c. ·10 cm. longus, c. ·08 cm. latus. Labellum apici gynostemii pedis insertum, mobile, porrectum, sigmoideum, carnosum, subcylindricum, exterius decrescens, apici acutum, lateribus leviter compressum, superne ultra medium sulcatum, super basin in lobos 2 erectos rotundatos glabros flavos minute atrorubenti-punctatos exeuns, supra carinis 2 pilosis et papillosis sulcam mediam limitantibus productum, inter lobos incrassatione longitudinali sulcata donatum, lateribus ultra lobos in pulvinos 2 atrorubenti-vesiculosos dilatatum, subtus pulvinis canalicula brevi apicem versus producta seperatis, super pulvinos omnino papillosum et longe atrorubenti-pilosum, subtus super basin sulca transversa brevi donatum, pone pulvinos flavescenti-ochreum, super pulvinos dense atrorubenti-suffusum, dimidio superiore atrorubens, c. ·80 cm. longum, trans pulvinos c. ·19 cm. latum. Gynostemium breve, rectum, apicem versus angustatum, intus leviter convexum, apici leviter dilatatum, flavum, c. ·18 cm. longum, c. ·12 cm. latum, alis latis erectis utraque stigmatis parte in lobum triangularem productis apici triangulari-ovatis obtusis margine antico dilatatis sub apice dente brevissimo obtuso exeuntibus flavis; clinandrium excavatum, transverse ovale, marginibus breviter et sparse denticulatum. Anthera cucullata, supra visa suborbicularis, in rostrum latum lineare truncatum minute denticulatum obtusangulariter recurvum valde convexum producta, connectivo longo erecto subulato inserta, flava, c. ·09 cm. longa. Pollinia 4 obovata, intus compressa, flava. Pes gynostemii basi cum gynostemio angulum rectum faciens, brevis, carnosus, linearis, apici

incurvus in lobos 2 conicos obtusos divergentes productus, c. ·10 cm. longus. Ovarium 6-sulcatum, furfuraceum, viride, apici atrorubenti-suffusum,, c. ·58 cm. longum, pedicello c. ·27 cm. longo.

This makes the third species of this section to be reported from this country. It is remarkable in that the lip is densely covered with very long hairs and in the absence of an appendage in the sinus between the lobes of the petals. The pedicels of the filaments are long and narrow causing the latter to be constantly in motion.

Pahang, Kuala Lipis town on a fruit tree, and at Krambit on a tree in the forest.

Described from living plants cultivated at Tembeling, Pahang.

Bulbophyllum (§ *Epicrianthes*) **papillosofilum,** sp. nov. Rhizoma pendulum, vaginis membraneis tectum, c. 20 cms. longum aut longius, c. ·13–·17 cm. diam., radicibus basilaribus ad substratum superioribus ad rhizoma adpressis, internodiis 1·5–2 cms. longis. Pseudobulbi valde quadrilaterales, cum rhizomate angulum acutum facientes, 1·5–2 cms. dissiti, 1-folii, vaginis membraneis tecti, superne et subtus compressi, lateribus leviter concavi, viridi-flavescentes, c. 1·20 cms. longi, c. ·50 cm. lati, c. ·35–·40 cm. crassi. Folium pendulum aut porrectum, crassiuscule coriaceum, ellipticum, subacutum, apicem versus decurvum, superne utraque sulcae mediae parte convexum, subtus utraque costae mediae inconspicuae parte concavum, basi tortum et ad petiolum brevissimum c. ·10 cm. longum angustatum, viride, c. 3·30–5 cms. longum, c. 1·80–2·40 cms. latum. Inflorescentiae e basi pseudobulbi intervallis exeuntes, vaginis membraneis tectae, fasciculatae, 1-florae, pedunculo brevi terete e basi apicem versus dilatato c. ·40 cm. longo, vaginis furfuraceo-punctatis. Bractea basi tubulosa, furfuracea, apici late ovata mucronata. Sepala carnosa, basi valde reflexa, ochrea, intus basi sordide atrorubenti-suffusa. Sepalum dorsale oblongum, sub apice angustatum, apici acutum, 5-nervium, intus basi leviter convexum, apici leviter concavum, extus apici convexum costa media inconspicue elevata, marginibus angulatum, bene 1 cm. longum, c. ·45 cm. latum. Sepala lateralia lanceolata, sub apice brevissime subulato-angustata, apici subacuta, 5-nervia, intus basi concava dimidio superiore leviter convexa, extus dimidio inferiore convexa, sub apice concava, marginibus angulata, bene 1 cm. longa, c. ·45 cm. lata. Petala brevissima et latissima, in lobos 2 divergentes falcate excurvos albos apici roseo-suffusos producta; lobus posticus anguste oblongo-ovatus, appendices c. 4 longe stipitatas rectas lineares teretes exterius decrescentes obtusas 1-nervias inaequemagnas albas dense grisei-papillosas ad

·50 cm. longas stipite ad ·07 cm. longo ferens, c. ·20 cm. longus, c. ·07 cm. latus; lobus anticus triangulari-ovatus, appendices c. 4 similes ferens, c. ·17 cm. longus, c. ·10 cm. latus, sinu inter lobos in appendicem 1 similem longissime stipitatam stipite c. ·20 cm. longo producto. Labellum apici pedis gynostemii insertum, mobile, pendulum, carnosum, sigmoidee subcylindricum, apicem obtusum versus angustatum, superne fere ad medium longitudinaliter sulcatum, basin versus in lobos 2 magnos rotundatos carnosos productum, lobis supra carinis 2 brevibus erectis exeuntibus, inter lobos utraque sulcae mediae parte carina longitudinali donatum, lateribus ultra lobos in pulvinos 2 dense atrorubenti-vesiculosos dilatatum, pulvinis subtus sulca brevi separatis sulca apicem versus leviter producta, super pulvinos omnino papillosum et breviter pilosum, subtus super basin sulca transversa et sulca longitudinali donatum, marginibus sulcae basi glabris super pulvinos papillosis et vesiculosis apicem attingentibus, lateribus concavum in formam carinae e basi usque apicem dilatatum, c. ·60 cm. longum, c. ·17 cm. diam. Gynostemium breve, rectum, intus convexum, c. ·22 cm. longum, ·15 cm. latum, alis latis apici in lobos 2 rotundatos et sinu in dentem subulatum exeuntibus; clinandrium satis excavatum, suborbiculare, marginibus valde dentatum; stigma profunde excavatum, triangulari-oblongum, obtusum. Anthera cucullata, suborbicularis, marginibus minute denticulata. Pollinia 4 flava. Pes gynostemii quam gynostemium paulo brevior, basi cum gynostemio fere angulum rectum faciens, brevis, carnosus, apici incurvus et in lobos 2 divergentes conicos obtusos productus, intus convexus et papillosus, extus basi sulcatus et papillosus. Ovarium 6-sulcatum, sparse furfuraceo-punctatum, c. ·70 cm. longum, pedicello c. ·20 cm. longo.

Nearest to *B. Epicrianthes, Hook. f.*, and *B. javanicum, J.J.S.*, in that the appendages of the petals are mobile. They are, however, papillose as in *B. vesiculosum, J.J.S.*, but in the latter species, as also in *B. rigidifilum, J.J.S.*, the appendages are rigid. This is the fourth species to be recorded from this country.

Pahang, Tahan river at Kuala Teku on trees overhanging the river.

Described from plants cultivated at Tembeling, Pahang.

Bulbophyllum minimibulbum, sp. nov. Rhizoma pendulum, ramosum, filiforme, vaginis membraneis tectum, c. 50 cms. longum aut longius, c. ·05–·07 cm. diam., internodiis c. ·80–2·25 cms. longis. Pseudobulbi subglobosoovoidei, rhizomati paralleli eoque adpressi, c. ·80–2·25 cms. dissiti, 1-folii, immaturi vagina magna membranea tecti, virides, c. ·15 cm. longi, c. ·10 cm. lati. Folium

pendulum, cum rhizomate angulum acutum faciens, lineari-lanceolatum, acutissimum, leviter crasse coriaceum, marginibus attenuatum, superne utraque sulcae mediae parte valde convexum marginibus recurvum, subtus utraque costae mediae valde conspicue elevatae parte concavum, grisei-viride, subtus pallidius, basi tortum et in petiolum brevem angustatum, c. 3–4·5 cms. longum, c. ·40–·70 cm. latum, petiolo c. ·30 cm. longo, c. ·08—10 cm. diam. sulcato et curvulo. Inflorescentia e rhizomate sub pseudobulbo exeuns, cum rhizomate angulum acutum faciens, laxiuscule c. 8-flora, pedunculo terete viridi c. ·80 cm. longo, c. ·07 cm. diam., nonnullis vaginis membraneis basilaribus obtecto furfuraceo et verrucoso apicem versus leviter incrassato, rachide furfuracea et verrucosa viridi c. 1 cm. longa. Bracteae oblongo-ovatae, supra angustatae, mucronatae, quam ovarium et pedicellum longiores, adpressae, marginibus minute erosulae, intus profunde concavae, extus convexae costa media satis conspicua, pallide virides, absque mucrone c. ·15 cm. longae, c. ·10 cm. latae, mucrone c. ·02 cm. longo. Flores vix aperti, c. 8. Sepalum dorsale porrectum, oblongo-ovatum, longe acuminatum, brevissime in subulam apiculiformem productum, intus concavum, extus convexum, 1-nervium, pellucide pallide flavescens apici flavum, c. ·35 cm. longum, c. ·12 cm. latum. Sepala lateralia pedi gynostemii adnata, falcata, late triangulari-ovata, sub apice angustata incrassata in subulam brevem producta, 1-nervia, intus concava, dimidio superiore sparse verruculosa, sub apice marginibus incurva et incrassata, extus costa media conspicua convexa, basi margine antico valde in mentum magnum oblongum obtusum dilatata, pellucide pallide flavescentia apici flava, c. ·33 cm. longa, c. ·28 cm. lata. Petala porrecta, oblongo-ovata, sub apice angustata, marginibus minute erosula, apici subacuta, 1-nervia pellucide pallide flavescentia, c. ·18 cm. longa, c. ·08 cm. lata. Labellum apici pedis gynostemii adnatum, simplex, unguiculatum, dimidio inferiore fere erectum, dimidio superiore rectangulariter recurvum et vix porrectum, sub apice recurvum, ungue oblongo et tenui; lamina lanceolata, obtusissima, marginibus recurva, superne utraque sulcae mediae longitudinalis vix usque apicem attingentis parte convexum, sulca basi marginibus papillosa, costis 3, intermedio brevissimo et in fascia parva et carnosa terminante, subtus utraque carinae mediae valde elevatae parte concava, flavescens; omnino explanatum absque ungue c. ·22 cm. longum, c. ·10 cm. latum, ungue c. ·03 cm. longo. Gynostemium c. ·08 cm. longum, supra in alas truncatas minute denticulatas exeuns; clinandrium excavatum, oblongum, intus convexum; rostellum in rostrum oblongo-ovatum obtusum productum; stigma excavatum, suborbicu-

lare. Anthera cucullata, minute papillosa, marginibus minute erosula, albida, connectivo magno erecto ovato-oblongo acuminato adnata. Pollinia 4, flava. Ovarium breve, crassum, e basi dilatatum, verrucosum. Pes gynostemii subsigmoideus, basi valde incrassatus, intus convexus, apici in lobos 2 divergentes incrassatos rotundatos exeuns, c. ·18 cm. longus.

I do not think that this interesting plant can be placed under any existing section of the genus. With its filiform pendulous rhizome, the minute distant pseudobulbs and the broad mentum it is very distinct.

It occurs very sparingly on Fraser Hill, Pahang, at about 4,000 to 4,300 feet elevation.

Described from living plants cultivated at Tembeling, Pahang.

Bulbophyllum (§ *Cirrhopetalum*) **geminatum**, sp. nov. Rhizoma repens, ramosum, immaturum vaginis membraneis tectum, c. ·25 cm. diam., dense radicans. Pseudobulbi c. 1–1·50 cms. dissiti, conspicue quadrilaterales, lateribus concavis, supra leviter curvuli, apici profunde excavati, pellucide flavescenti-virides, 1-folii, immaturi nonnullis vaginis ovatis vel oblongis acutis tecti, cum rhizomate angulum acutum facientes, c. 3·7–4·5 cms. longi, c. 1·2–1·5 cms. lati. Folium oblongum vel oblongo-lanceolatum, obtusum, coriaceum, sub apice leviter recurvum, intus obtusangulariter concavum sulca media conspicua, subtus obtusangulariter convexum costa media satis conspicua, basi tortum et in petiolum brevem sulcatum c. ·25 cm. longum, c. ·25 cm. diam. angustatum, viride supra nitidum, c. 9 12 cms. longum, c. 2·5–3 cms. latum. Inflorescentiae e basi pseudobulbi exeuntes, erectae, 2-florae, pedunculo terete apicem versus incrassato c. 7 cms. longo basi c. ·08 apici c. ·16 cm. diam., vaginula 1 basilari basi tubulosa parte libra subulata apici acutissima furfuracea donato parte libra c. ·80 cm. longa c. ·32 cm. lata. Bracteae triangulariter lanceolatae, acutissimae, intus profunde concavae, c. 5-nerviae, c. ·60 cm. longae, c. ·38 cm. latae. Flores 2 geminati, majusculi. Sepalum dorsale oblongum, medio leviter dilatatum, basi abrupte in lobos 2 brevissimos triangulares acutos dilatatum, super basin valde reflexum, 5-nervium, nervis furcatis, extus furfuraceum, minute papillosum, intus basi concavum super basin breviter convexum supra concavum sub apice profunde conico-concavum, extus basi concavum supra convexum sub apice et abrupte et alte et cucullate convexum apici in appendicem longam teretem basi erectam supra flexuosam apici clavatam c. 1·30 cms. longam minute papillosam productum, omnino bruneo-purpureum, c. ·80 cm. longum, c. ·45 cm. latum. Sepala lateralia pedi gynostemii adnata, basi falcate curvula et torta, super basin

lineari-oblonga, longe acuminata, papillosa, extus furfuracea, margine postico super basin ad apicem liberum teretem incrassatum cohaerentia, marginibus conglutinatis in formam carinae elevatis, 5-nervia, nervis furcatis, margine antico valde tubulose involuta, subtus grisei-viridia dimidio inferiore seriebus longitudinalibus c. 5 macularum minutarum purpurearum basi confluentibus, superne flavescenti-viridia dimidio inferiore dense purpureo-maculata, c. 9 cms. longa, parte latissima c. ·66 cm. lata basi c. ·30 cm. lata. Petala vix patentia, falcata, oblique oblonga, sub apice angustata, apici lineari-oblongo truncato recurva, margine antico super basin abrupte curvulo et dilatato supra vix recto, margine postico c. medio rectangulariter et lobuliformiter dilatato, 3-nervia, nerva intermedia ultra apicem in setam c. ·02 cm. longam producta, extus sordide griseia, intus nitide bruneo-purpurea, c. ·50 cm. longa, c. ·40 cm. lata. Labellum apici pedis gynostemii adnatum, mobile, carnosum, subcylindricum, acutum, basi erectum, super basin decurvum, superne basi in lobos 2 oblongos rotundatos margine antico recurvos productum, super lobos carinis 2 papillosis vix apicem attingentibus et sulcam latam papillosam limitantibus, subtus e loco insertionis vix usque apicem anguste sulcatum, sordide flavescens purpureo-maculatum, c. ·50 cm. longum, c. ·15 cm. diam. Gynostemium breve, rectum, alis latis fere medio in lobum brevem triangularem dilatatis supra laciniatis, absque connectivo c. ·30 cm. longum, c. ·15 cm. latum, bruneo-purpureum; clinandrium profunde conico-excavatum, oblongum, marginibus laciniatum; stigma profunde excavatum, anguste lineare. Anthera alte conico-cucullata, papillosa, supra visa oblonga, in carinam mediam elevata, apici in rostrum breve late lineare retusum convexum denticulatum et papillosum marginibus erosulum producta, bruneo-purpurea, c. ·10 cm. longa, c. ·07 cm. lata, connectivo anguste lineari c. ·05 cm. longo. Pollinia valde lateraliter compressa, e latere visa oblique oblonga, margine basilari recto. Pes gynostemii basi cum gynostemio angulum obtusum faciens, sub apice rotundate incurvus, apici in lobos 2 conicos obtusos rectangulariter divergentes productus, longus, angustus, intus leviter convexus, e basi intus alte convexa apicem versus angustatus, c. ·60 cm. longus, parte libra c. ·25 cm. longa. Ovarium 6-sulcatum, viride purpureo-suffusum, c. 1·30 cms. longum, pedicello c. ·58 cm. longo.

This species appears to be closely allied to *B. biflorum*, *T. & B.*, but differs in the shorter distance between the pseudobulbs, the shorter inflorescence, the smaller differently coloured upper sepal, the differently coloured and marked lateral sepals, the different form of the petals with a much

shorter apical seta, the brownish purple anther, etc. The sepals and petals elongate after the flower opens.

Pahang, Krambit, one plant only found.

Described from the living plant cultivated at Tembeling, Pahang.

Eria (§ *Hymeneria*) **punctata,** *J.J.S. in Bull. Dep. Agr. Ind. Neerl. No. XIII (1907) 38; in Bull. Jard. Bot. Buit. Ser. III, Vol. VI, t. 3, f. IV.*

This curious plant with its 1-leaved pseudobulb-like stems on a rather long-creeping rhizome has not hitherto been reported from the Peninsula. It occurs sparingly on Fraser Hill, Pahang, at about 4,300 feet elevation, and much more rarely on Gunong Tahan at Skeat's ridge at about 4,500 feet elevation. It was described by Dr. J. J. Smith from plants collected in West Java.

Eria (§ *Hymeneria*) **Jagoriana,** *Krzl. in Engl. Bot. Jahrb. XLIV, Beibl. n. 101 (1911) 24; in Pflanzenr. IV, 50, II, B, 21 (1911) 93, fig. 19 A-C; J.J.S. in Bull. Jard. Bot. Buit. Sér. III, Vol. III, Livr. 3 (1921) 285; in Bull. Jard. Bot. Buit. Sér. III, Vol. VI, t. 3, f. V.; E. tenggerensis, J.J.S. in Bull. Jard. Bot. Buit. Sér. II, XIV (1924) 37.*

Not hitherto reported from the Peninsula. It occurs very sparingly on Fraser Hill, Pahang, at about 4,000 to 4,300 feet elevation.

Eria (§ *Hymeneria*) **atrovinosa,** sp. nov. Rhizoma longiusculum, repens, multi-ramosum, teres, c. ·70 cm. diam. Caules subapproximati, cylindrici, e basi exterius decrescentes, dimidio superiore saepe subsigmoidee curvuli, apici c. 3-fo'ii, initio vaginis c. 8 tenuibus tecti, c. 5–8 cms. longi, 1·3–1·7 cms. diam., internodiis altissimis 2 brevissimis exceptis c. 4 inaequemagnis internodio superiore maximo c. 3 cms. longo. Folia 2–3 ex apice caulis exeuntia, lorata, apici acuta saepe oblique acuta, tenuiter coriacea, supra sulca media subtus costa media satis conspicua donata, basi angustata intus concava extus convexa, subnitide viridia subtus leviter pallidiora, c. 12–18 cms. longa, c. 1·75–2·25 cms. lata. Inflorescentiae 2–3 e nodis superioribus erectae vel suberectae, dimidio inferiore nonnullis vaginulis oblongo-oblanccolatis aut subspathulatis obtusis bracteiformibus inaeque magnis maximis c. 2·25 cms. longis c. 1 cm. latis lacteis ornatae, dimidio superiore laxe multi (c. 15)-florae, lacteae purpureo-pubescentes, c. 15 cms. longae. Bracteae valde patentes, oblongo-oblanceolatae, acutae, basi angustatae, marginibus recurvis, inferiores maximae ad 2–2·25 cms. longae, c. ·65 cm. latae. Flores valde patentes, subsecundi. Sepalum dorsale basi erectum, fere medio valde reflexum, oblongo-lanceolatum, apici subacuto incurvum, sub apice angustatum, 5-nervium, pellucide lacteum

apici roseo-suffusum, extus basi atropurpureo-pubescens, c. 1·20 cms. longum, c. ·38 cm. latum. Sepala lateralia pedi gynostemii adnata, falcata, oblongo-ovata, obtusa, fere medio valde reflexa, apici incurva, 5-nervia, pellucide lactea apici leviter roseo-suffusa, extus basi atropurpureo-pubescentia, c. 1 cm. longa, ·45 cm. lata, basi in mentum breve rectum obtusum lacteum atropurpureo-pubescens dilatata. Petala subcucullata super gynostemium porrecta, falcata, oblongo-oblanceolata, subacuta, 3-nervia, intus concava sub apice excurva et convexa, extus convexa sub apice leviter concava, parte ¼ basilari albida, partibus ¾ superioribus atrovinosa marginibus pallidiora, c. 1 cm. longa, c. ·35 cm. lata. Labellum apici pedis gynostemii adnatum, 3-lobum, brevissime unguiculatum, omnino papillosum, lamina in carinas 3 basin haud attingentes elevata, carinis basi confluentibus supra divergentibus atrovinosis dense albo- et clavato-pilosis exterioribus ad lobos laterales intermedio usque apicem lobi intermedii attingentibus apici incrassatis et elevatis, explanatum c. ·90 cm. longum, trans lobos laterales c. ·58 cm. latum. Lobi laterales erecti, falcati, oblongi, papillosi, apici rotundati, margine postico late rotundate incurvi, atrovinosi, medio pallidiores, basi albidi. Lobus intermedius bilobus lobis oblongis obtusis, sinu in dentem triangularem carnosum productus, basi clavato-pilosus, apici papillosus, lacteus leviter sordide pallide purpureo-suffusus, dente pallide purpureo, c. ·30 cm. longus, c. ·35 cm. latus. Gynostemium breve, vix rectum, supra angustatum, cum ovario angulum obtusissimum faciens, intus leviter concavum, c. ·35 cm. longum, c. ·20 cm. latum, alis brevibus apicem versus dilatatis et truncatis; clinandrium profunde excavatum, transverse ovale, in costam longitudinalem mediam elevatum, marginibus minute erosulum; rostellum in rostrum breve oblongum truncatum decurvum productum; stigma majusculum, leviter excavatum, transverse ovale. Anthera cucullata, basi in lobos 2 late oblongos rotundatos marginibus tenuissimos et erosos producta, supra visa quadrata, flava. Pollinia 8 angulatim obpyriformia, supra et subtus compressa, flava, viscis 2 contiguis flavis adnata. Ovarium cum pedicellum ad c. 2·25 cms. longum, lacteum purpureo-pubescens.

This plant is of the same affinity as *E. bractescens, Lndl.*, and should be placed among the short-stemmed species of the section.

Pahang, Mentakab on large trees in the forest.

Described from living plants cultivated at Tembeling, Pahang.

Sarcostoma javanica, *Bl. Bijdr. 340, F. 45; Rchb. F. Bonp. 1857, 54; J.J.S. in Fl. Buit. VI (1905) Orch. 304;*

Dendrobium javanicum, Lndl. Journ. Linn. Soc. III, 20; Miq. Fl. Ind. Bat. III, 644; D. sarcostoma, Lndl. Gen. and Sp. Orch. 80; Callista javanica, O.K. Rev. Gen. Pl. II, 655; Ceratostylis cryptantha, Ridl. Journ. Linn. Soc. XXXII, 309; Mat. I, 110; Fl. Mal. Pen. IV, 110.

Pahang, Krambit, Mentakab, and Fraser Hill up to 4,300 feet altitude.

Cultivated in the Botanic Gardens, Singapore.

Sarcostoma linearis, n. comb. *Ceratostylis linearis, Ridl. Journ. Roy. As. Soc. S. Br. 61, P. 40; Fl. Mal, Pen. IV, 110.*

This species should doubtless be included under *Sarcostoma, Bl.*

Phalaenopsis appendiculata, sp. nov. Caules breves ad c. 1·75 cms. longi, basi radicantes. Folia c. 4 elliptica vel late lanceolata aut oblanceolato-oblonga, tenuiter coriacea, superiora maxima, ad c. 7 cms. longa, c. 3·5 cms. lata, apici leviter inaequaliter et obtuse biloba, basi in petiolum c. ·35 cm. longum angustata, vaginis apici abrupte recurvis et elongatis. Inflorescentiae e basi vaginae, suberectae, pauciflorae, pedunculo terete ad apicem dilatato basi vaginulis 1–2 brevibus c. 1·5 cms. longo, rachide incrassata c. 1 cm. longa. Flores succedanei, patentes, per dies c. 8 durantes, albi maculis violaceis ornati. Sepalum dorsale oblongum, acutum, intus profunde cucullate concavum, extus convexum carina longitudinali, super gynostemium decurvum, marginibus erosis, 3-nervium, album violaceo-maculatum, c. ·40 cm. longum, c. ·35 cm. latum. Sepala lateralia pedi gynostemii adnata, subfalcata, valde patentia, oblique oblonga, subacuta, intus leviter concava, extus leviter convexa, in carinam mediam et in carinam humiliorem utrinque elevata, 3-nervia, alba violacea-maculata, ·50 cm. longa, c. ·45 cm. lata. Petala subfalcata, vix patentia, suborbicularia, basi in unguem brevissimum late linearem angustata, dimidio superiore leviter incurvula, marginibus valde erosa, nerva media 1 nerva breviore utrinque, extus in carinam conspicuam elevata, c. ·37 cm. longa, c. ·35 cm. lata, alba violaceo-maculata. Labellum apici pedis gynostemii adnatum, 3-lobum, c. ·66 cm. longum, trans lobos laterales c. ·85 cm. latum; Lobi laterales erecti, lineari-oblongi, acuti, margine postico gynostemio adpressi, dimidio inferiore margine antico in lobum brevem et latum acute bidentatum abrupte producti, intus concavi, extus convexi, albi apici pallide violacei, lobis dilute flavis maculis violaceis minutis ornatis, c. ·30 cm. longi, basi c. ·08 cm. lati; lobus intermedius mobilis, porrectus, 3-lobus, lobis exterioribus triangularibus obtusis margine postico rectis margine antico rotundate

curvis, lobo intermedio triangulari apici truncato et erosulo, basi callis 2 intermediis interpositis et callis 2 minoribus utrinque, albus marginibus striisque violaceis ornatus; callus posticus lineari-oblongus, apici in lobos profunde 2-laciniatos productus, albus minute violaceo-notatus; callus anticus lineari-oblongus, apici bilobus, dilute violaceus, lobis in setam longam et undulatam albam productis; calli exteriores breves, valde laciniati, violacei, laciniis albis. Gynostemium breve, latum, medio dilatatum, alis brevissimis rotundatis, dorso apici in lobum longum ovatum obtusum productum; rostellum breve, triangulare, in lobos 2 longos subulatos apici decurvos productum; stigma latissimum, transverse ovale. Anthera cucullata, carinata, carina in rostrum lineari-oblongum extus convexum intus profunde concavum apici truncatum erosulum producta. Pollinia 4 inaequalia, flava, stipite anguste spathulato basi abrupte subulato-angustato, glandula triangulari.

This is a very interesting species in that as far as I can see there are 4 pollinia present. In all other respects it appears to partake of the characters of the genus *Phalaenopsis*. The pollinia are very unequal and easily separable, the posterior pair being greatly reduced. They fit closely into 2 bodies, one of the posterior small pollinia fitting into a depression in the corresponding much larger anterior one.

Pahang, Kuala Tembeling, on small trees in the forest.

Described from living plants cultivated at Tembeling, Pahang.

Sarcanthus Holttumii, sp. nov. Caulis subserpentinus, sectione transversa ellipticus, c. 25 cms. longus, lateraliter compressus, internodiis apicem versus incrassatis ad c. 2 cms. longis. Folia patentia, crasse coriacea, lineari-oblonga, sub apice c. 2 cms. abrupte angustata, apici inaequaliter obtuseque biloba et leviter recurva, basi leviter angustata et late canaliculate concava, haud petiolato-angustata, marginibus basi erectis, supra utraque sulcae mediae parte convexa transverse et minute rugulosa, marginibus attenuatis subundulatisque, subtus leviter convexa costa media apici basique satis conspicue elevata medio saepe sulcata, nitide pallide flavo-viridia, costa media subtus atriore, c. 10–13 cms. longa, 1·90–2·50 cms. lata, vaginis tubulosis transverse et minute rugulosis internodos superantibus facie antica et facie postica carinatis basi c. ·70 cm. apici c. ·90 cm. latis. Inflorescentiae e vagina super basin exeuntes, vaginas 2 perforantes, simplices, basi porrectae, superne flexuosae, multi-florae; pedunculus teres, apicem versus incrassatus vaginulis c. 3 tubulosis donatus, c. 2·40 cms. longus; rachis flexuosa, leviter incrassata, angulata, c. 5·50 cms. longa, basi vaginula ovata acuminata acuta carnosa profunde concava donata. Bracteae quaquaversae, patentes, carnosae, triangu-

lares, apici acutae, ad ovarium adpressae, marginibus minute erosulae, extus convexae, intus concavae, dorso incrassatae, c. ·16 cm. longae et aequilatae. Flores succedanei, c. 7 simul expansi, sessiles, per nonnullos dies durantes. Sepala petalaque valde expansa, sordide flavo-viridia, sepalis intus et apici et marginibus et costa media exceptis pallide castaneo-suffusa. Sepalum dorsale erectum, oblongum, apici truncatum et vix retusum leviter recurvum, intus basi in gibba leviter semilunatum albidum instructum, 3-nervium, intus superne leviter concavum sub apice leviter convexum, extus convexum super medium leviter incurvum costa media satis elevata sub apice abrupte attenuatum, marginibus apicem versus erosulis, c. ·40 cm. longum, c. ·25 cm. latum. Sepala lateralia gynostemio et basi labello breviter adnata, subfalcata, e basi angusta transverse quadrangularia, apici valde apiculata, margine postico vix recto, margine antico sub apice late rotundateque dilatato, marginibus recurvis apicem versus erosulis et sparse laciniatis, 3-nervia, intus convexa, extus utraque costae mediae conspicue elevatae parte concava, c. ·48 cm. longa, c. ·25 cm. lata, apiculo anguste conico obtuso vix ·10 cm. longo. Petala fere medio recurva, oblongo-spathulata, obtusa, 1-nervia, sordide flavo-viridia, omnino pallide castaneo-suffusa, c. ·30 cm. longa, c. ·10 cm. lata. Labellum basi gynostemii adnatum, 3-lobum, calcaratum, lamina inter lobos laterales canaliculata alba in canalicula carina brevi alba basi lobi intermedii in tubercula parva terminante, intus dorso callo pendulo T-formi carnoso curvulo apicem versus papilloso exterius decrescente basi in lobulas 2 transversas triangulares obtusas concavas producto et faucem calcaris claudiente, basi utraque canaliculae mediae parte fascia magna puberula flava donatum, explanatum c. ·55 cm. longum, trans basin lobi intermedii c. ·37 cm. latum; lobi laterales brevissimi, lati, truncati, albidi; lobus intermedius porrectus, quam lobos laterales multo major, triangulari-hastatus, crasse carnosus, apici leviter rotundatus vix truncatus, obtusissimus, supra medio excavatione triangulari carina transversa utrinque limitata, carinis apicem versus confluentibus et vix contiguis, basi in lobulas 2 triangulari-oblongas truncatas bidentatas productus, apice medioque exceptis lilacinus, subtus convexus sulca media angusta donatus apici truncatus albidus lobulis basalibus pallide lilacinus, c. ·30 cm. longus, c. ·37 cm. latus; calcar pendulum, cum ovario angulum acutum faciens, vix rectum, basi sepalis lateralibus breviter adnatum, cylindricum, obtusum, dorso compressum basi sulca brevi transversa et canalicula media angusta donatum, intus dimidio inferiore septatum, albidum, c. ·30 cm. longum, c. ·16 cm. diam. Gynostemium breve, apicem truncatum versus dilatatum, c. ·15 cm. longum, alis carnosis rotundatis;

clinandrium leviter excavatum, subquadratum; rostellum in rostrum brevissimum triangulare acutum productum; stigma brevissimum, orbiculare, profunde excavatum. Anthera cucullata, supra visa transverse oblonga, abrupte angustata et in rostrum triangulare anguste obtusum producta, pallide ochrea vix alba. Pollinia 4 inaequalia, subovalia, pallide flava; stipes anguste linearis, sub apice abrupte spathulato-dilatatus, albus; glandula parva, ovalis, pallide flava. Ovarium 6-sulcatum, pedicello 0.

The nearest ally of this plant is undoubtedly *S. Scortechinii*, Hook. f., to which it is closely related. It differs, however, in the quite different form of the leaves, the much more obtuse upper sepal, the different form of the petals, the very fleshy truncate midlobe with the 2 basal lobules indented, the longer and less elevate callus with 2 short basal lobules, the unequal pollinia and the rather shorter anther with a relatively longer beak.

Described from a flowering plant which has been in cultivation in the Botanic Gardens at Singapore for some years and which flowered there during November and December, 1928.

The exact locality from which the plant originally came is unknown.

Saccolabium Hendersonii, sp. nov. Caulis pendulus, rigidus, serpentinus, sectione transversa anguste ellipticus, ad c. 22 cm. longus internodis c. 1 cm. longis. Folia patentia, linearia, coriacea, apici angustata, inaequaliter et acute biloba, basi abrupte angustata subtortaque, superne utraque sulcae mediae parte convexa, subtus costa media conspicue elevata, sordide viridia saepe dense sordide purpureo-maculata vel suffusa, c. 7–9 cms. longa, c. ·80–1 cm. lata, vaginis e basi dilatatis nitidulis marginibus carinatis sordide viridibus saepe sordide purpureo-suffusis. Inflorescentiae simplices, e basi vaginae exeuntes, supra dense multiflorae, inferne vaginulis 2 adpressis late ovatis acutis, dilute flavescens, rachide quam pedunculum c. ·50 cm. longum paulo crassiore basi nonnullis maculis minimis purpureis ornata 1–3 cms. longa. Bracteae patentes, quaquaversae, ovatae, acuminatae, apici acutae, marginibus ciliolatae, intus concavae, extus convexae papillosae pilosaeque, initio dilute flavescentes deinde scariosae, c. ·30 cm. longae, c. ·10 cm. latae. Flores parvi, patentes, c. ·75 cm. longi, trans petala c. ·40 cm. lati. Sepalum dorsale oblongo-oblanceolatum, apici obtusum, marginibus ciliolatum, extus dense papillosum pilosumque costa media elevata, basi rectum, intus apici concavum cucullate incurvum,

flavescens, c. ·25 cm. longum, c. ·10 cm. latum. Sepala lateralia satis patentia, oblique triangulari-ovata, obtusa, marginibus minute erosula et ciliolata, margine postico subrecto, margine antico super basin valde rotundato, intus concava apici incurva praesertim medio super basin rare pilosa, extus dense papillosa et pilosa costa media conspicue elevata, aurantiaca, marginibus pallidiora, c. ·25 cm. longa, c. ·18 cm. lata. Petala patentia, apici incurva, linearioblanceolata, subacuta, marginibus minute ciliolata, extus papillosa costa media conspicue elevata, intus sparse minute pilosa, c. ·20 cm. longa, c. ·08 cm. lata. Labellum basi gynostemii adnatum, 3-lobum, calcaratum, ad summam calcaris c. ·53 cm. longum; lobi laterales erecti, brevissimi latissimique, e basi obcuneate dilatati margine antico longiore, apici truncato margine castaneo, intus basi concavi apici convexi, quam petala pallidiores, apici c. ·20 cm. lati; lobus intermedius quam lobos laterales multo brevior, triangulari-ovatus, brevissime acuminatus, obtusus, crasse carnosus, intus alte conico-convexus, ad summam callo oblongo truncato humili longitudinaliter sulcato et ex apice ad callum costa longitudinali elevata donatus, faucem calcaris fere claudiens, albidus; calcar pendulum, eseptatum. lateribus compressum, medio dilatatum, apici incurvo anguste obtusum, extus papillosum et rare pilosum, flavum basi pallidius, c. ·38 cm. longum. Gynostemium apicem versus dilatatum, breve latumque, auriculis carnosis transverse obcuneatis vel oblongis intus stria longitudinali purpurea ornatis; rostellum elongatum, inter auriculas gynostemii sulcam formans; stigma excavatum, transverse ovale. Anthera conico-quadrata, facie antica sulcata, in rostrum triangulare obtusum abrupte decurvum producta. Pollinia 2 oblonga, superne et inferne compressa, dilute flavescentia, stipite anguste lineari apici abrupte spathulato-dilatato albo, glandula parva, oblongo-ovali alba. Ovarium 6-sulcatum, cum pedicello dense pubescens. Capsula oblongo-obpyriformis, recurva, breviter pedicellata, dense papillosa et pubescens, sordide viridis saepe purpureo-suffusa, c. ·75 cm. longa, c. ·33 cm. diam.

Pahang, Tembeling, Mentakab, Krambit, etc., not uncommon on small trees in the forest.

Described from living plants cultivated at Tembeling, Pahang.

Abdominea minimiflora, *J.J.S. in Bull. Jard. Bot. Buit. Ser. 2, XXV (1917) 98; A. micrantha, J.J.S. in Bull. Jard. Bot. Buit. Ser. 2, XIV (1914) 53; Bull. Jard. Bot. Buit. Ser. 3, VI, t. 25, f. 1; Saccolabium minimiflorum, Hook. f. Fl. Brit. Ind. VI (1890) 59; Ic. Pl. XXII (1894) 2133.* The plants in the herbarium at Singapore are identical with those from Java as described and figured by Dr.

J. J. Smith as quoted above. The Singapore plants are labelled *Saccolabium minimiflorum, Hook. f.*, and were collected by Ridley at Batu Caves, Selangor, in December, 1896. I have not seen Scortechini's original plants from Perak.

I am now able to record this curious plant from Pahang at Krambit and Kota Glanggi.

Ascochilopsis, gen. nov.

Caules perbreves, penduli vel ascendentes, basi ramosi et radicantes. Folia patentia, crasse carnosa, vaginis tubulosis carnosis. Inflorescentiae super basin vaginae sub radice emissae, saepe 2 vel plures superpositae, erectae suberectaeve, dense multiflorae, pedunculo muricato, rachide valde incrassata pedunculum subaequante aut breviore. Bracteae minutae, quaquaversae. Flores in excavationibus rachidis inserti, intervallis brevibus 1–4 simul expansi. Sepala petalaque subsimilia, valde patentia. Labellum basi gynostemii adnatum, 3-lobum, calcaratum, lobis lateralibus basilaribus erectis carnosis, lobo intermedio brevissimo latissimoque crasse carnoso, calcare maximo dependente late lateraliter dilatato. Gynostemium breve, rectum, rostello in rostrum instructo, pede gynostemii 0. Anthera cucullata, uniloculata, rostrata. Pollinia 2, stipite apici spathulato-dilatato, glandula lineari. Ovarium 6-sulcatum. Capsula lineari-cylindracea.

A small epiphyte with the manner of growth of *Sarcochilus biserratus, Ridl.* In the inflorescence, especially the peduncle, and in the pollinia it resembles the section *Ascochilus* of that genus. In the absence of a column foot it resembles the genus *Saccolabium* to which perhaps it is nearest, but I do not know of any section of this genus or its allies to which this distinct and interesting species could be properly assigned.

Ascochilopsis myosurus, comb. nov. *Saccolabium myosurus, Ridl. in Journ. Roy. As. Soc. Str. Br. 39 (1903) 84; Mat. I, 172; Fl. Mal. Pen. IV (1924) 173.* Caules plures validi, ascendentes aut penduli, apici foliis 10 aut pluribus, basi radicantes et ramosi, ad c. 7 cms. longi. Folia patentia, lorata vel lorato-oblanceolata, praesertim basin versus sensim angustata, sub apice breviter angustata, anguste et oblique obtusa, crasse carnosa, intus utraque sulcae mediae parte convexa atroviridia, subtus convexa, pallidiora, 5–20 cms. longa, ·60–1·50 cms. lata, vaginis crasse carnosis tubulosis sese amplectantibus. Inflorescentiae vaginam super basin sub radice perforantes, saepe 2 aut plures superpositae, erectae suberectaeve, dense multiflorae; pedunculus teres, apicem versus incrassatus, nonnullis vaginulis minutis donatus, muricatus aut verrucoso-muricatus, viridis

praesertim sordide rubro-suffusus, 2–5 cms. longus, basi ·08–·10 cm. diam.; rachis valde incrassata, tumida, praesertim sparse furfuraceo-punctata, viridis, 1–4·50 cms. longa, ·20–·28 cms. lata. Bracteae minutae, quaquaversae, patentes, late ovatae, acutae, saepe papillosae, marginibus erosulae, intus concavae, extus convexae carina media conspicue elevata. Flores in excavationibus rachidis inserti, intervallis brevibus 1–4 simul expansi, per diem 1 durantes. Sepala petalaque valde patentia, pellucide flava. Sepalum dorsale oblongum, apicem versus angustatum, apici late truncato-obtusum, super basin reflexum, super medium leviter obtusangulariter incurvum, 1-nervium, marginibus saepe minute erosulum, extus sparse minute papillosum carina media satis elevata, c. ·28 cm. longum, c. ·11 cm. latum. Sepala lateralia basi petalis breviter adnata, subfalcata, late oblonga, sub apice obtuso angustata, basi leviter reflexa, praesertim marginibus minute erosula, extus sparse minute papillosa, carina media conspicue elevata, 1-nervia, c. ·25 cm. longa, c. ·15 cm. lata. Petala basi sepalis lateralibus breviter adnata, subfalcata, oblonga, sub apice angustata, apici late truncato-obtusa, super basin leviter reflexa, sub apice incurva, 1-nervia, marginibus saepe minute erosula, intus profunde sulcato-concava, apicem versus leviter convexa, extus convexa super medium cucullate incurva carina media conspicue elevata, c. ·25 cm. longa, c. ·10 cm. lata. Labellum basi gynostemii adnatum, 3-lobum, calcaratum, c. ·15 cm. longum, c. ·10 cm. latum; lobi laterales erecti, carnosi, subtorti, oblongi, truncati, papillosi, lateraliter compressi, marginibus posticis basi contiguis, albi basi flavi; lobus intermedius carnosus, brevissimus, latissime triangularis, acuminatus, apice carnoso conico anguste obtuso, papillosus subtus sulca media donatus, niveus, basi maculis aurantiacis 2 ornatus; calcar maximum, pendulum, oblongo-obcuneatum, apici extus inconspicue 3-lobum, lobis rotundatis, lateribus valde dilatatum, extus dorso utraque carinae mediae parte leviter concavum, parietibus crasse carnosis, intus superne angustissimum et latissimum inferne dilatatum dense pilosum, niveum, c. ·20 cm. longum, c. ·27 cm. latum, c. ·14 cm. crassum. Gynostemium breve, rectum, flavum, c. ·07 cm. longum et aequilatum; clinandrium utraque costae mediae parte leviter concavum; rostellum magnum, in rostrum longum lineare basi decurvum apici rectangulariter incurvum subtus concavum supra convexum in dentibus subulatis 2 terminans instructum, flavum; stigma profunde excavatum, transverse oblongum, margine inferiore in lobum oblongum obtusum productum. Anthera cucullata, transverse ovalis, 1-loculata, marginibus minute erosula, in rostrum lineare truncatum intus concavum extus convexum c. ·02 cm., longum producta, semipellucide flava,

absque rostro c. ·06 cm. longa, c. ·08 cm. lata. Pollinia 2 subobpyriformia, pallide flava. Pes gynostemii 0. Ovarium 6-sulcatum. Capsula lineari-cylindracea, c. 1·75–2 cms. longa, c. ·18–·25 cm. diam.

Under favourable conditions this plant often forms small clumps in the manner of *Sarcochilus biserratus, Ridl.* It is very variable in the form of the leaves and the dimensions of leaves and inflorescence.

Description from living plants taken at Kuala Lipis and Tembeling and cultivated at the latter place. I must also report it from Bekok in Johore.

Sarcochilus virescens, *Ridl. in Journ. Roy. As. Soc. Str. Br. XXXVII, 85; Mat. I, 176; Fl. Mal. Pen. IV, 179.* Stems very short, ascending, stout, up to 2·50 cms. long, c. ·20 cm. diam., rooting at base, internodes c. ·25 cm. apart. Leaves spreading, thickly fleshy, base narrowed and slightly twisted, linear-lorate or lanceolate-lorate, subfalcate, apex unevenly acutely bilobed, above grey-green with mid-nerve sulcate, below convex, paler, with the mid-nerve inconspicuous except at apex, up to c. 4 cms. long, 1 cm. wide; sheaths short but much exceeding the internodes, apex curved outwards, older ones faintly longitudinally wrinkled, c. ·30 cm. long. Inflorescence much shorter than the leaves, suberect, c. 8-flowered, peduncle minute thick slightly flattened, rachis strongly flattened laterally, up to 1·50 cms. long. Bracts alternate, spreading, fleshy, below broadly ovate, inside deeply concave, above convex produced at apex to a long conico-cylindric apiculus, margins erose, c. ·17 cm. long, c. ·12 cm. wide at base. Flowers appearing singly at rather long intervals, strongly fragrant and lasting one day. Upper sepal elliptic apiculate, inside convex on each side of the median nerve, 5-nerved, greenish-yellow, c. ·60 cm. long, c. ·35 cm. wide, apiculus cornuform curved c. ·04 cm. long. Lateral sepals adnate to the column foot, spreading, subfalcate, oblong-ovate, apiculate, 5-nerved, greenish-yellow, c. ·50 cm. long, c. ·35 cm. wide, apiculus horn-shaped curved c. ·04 cm. long. Petals not widely expanded, narrowly elliptic, subacute, base slightly clawed, 3-nerved, greenish-yellow, c. ·60 cm. long, c. ·20 cm. wide. Lip adnate to the apex of the column foot, 3-lobed, not spurred; side lobes oblong, apex rounded, whitish, c. ·25 cm. long, c. ·17 cm. wide at base; midlobe conic obtuse, very fleshy, flattened below, pale greenish-yellow, c. ·20 cm. long, callus a narrow orange ridge running from the base of the sinus between the side lobes to the base of the midlobe. Column short straight, dilate in the middle, pale yellowish, c. ·20 cm. long, ·25 cm. wide; clinandrium orbicular, slightly excavate; rostellum bilobed, lobes subulate yellow; stigma very large,

suborbicular, deeply excavate, occupying nearly the whole face of the column. Anther 2-celled, cucullate, grooved, with a triangular-ovate beak, yellow. Pollinia 2 on an oblanceolate caudicle with an oval disc. Column foot making about a right-angle with the column, linear-oblong, apex slightly retuse, contracted and very obtusangularly upcurved in the middle, c. ·35 cm. long, ·17 cm. wide at apex. Capsule triquetrous, c. 2 cms. long, c. ·50 cm. wide.

This plant certainly belongs to the same affinity as *Chroniochilus tjidadapensis, J.J.S.* from Java, and *Sarcochilus tembelingensis, Carr.* These plants resemble each other in habit, with the exception that in *S. virescens, Ridl.*, the flowers only last one day, whereas in the other two species they remain fresh for many days. All three species have the inflorescence short, few-flowered, rather laterally flattened with alternate bracts, and the same structure of the lip. It would appear that *S. virescens, Ridl.*, by its flowering duration, would serve to connect *Chroniochilus, J.J.S.*, with the genus *Sarcochilus, R. Br.*, and I fail to see how the chief remaining feature, namely the unspurred lip, would be sufficient to keep it distinct.

The suppression of the spur is well illustrated in some of the species of the section *Ascochilus, Ridl.* In *S. emarginatus, Rchb.*, the cavity of the spur is greatly reduced, in *S. mentakabensis, Carr*, the spur is very slender with the cavity represented by a slit no more in diameter than a fine human hair, while in *S. decipiens, J.J.S.*, and *S. ciliatus, J.J.S.*, it is represented by a small shallow sac at the base of the lip. Finally in *S. siamensis, Carr*, the spur is entirely suppressed and the process has been carried further than is the case in *S. virescens, Ridl., S. tjidadapensis* (*J.J.S.*) *Carr*, and *S. tembelingensis, Carr*, a close ally of the latter plant. In these three species the former position of the spur is clearly indicated by a minute fissure at the base of the sinus between the sidelobes, whereas in *S. siamensis, Carr*, no trace of the spur remains, the lip being fleshy from the base. None of the species of the section *Ascochilus, Ridl.*, quoted could possibly be separated from that section.

It appears to me that *S. virescens, Ridl., S. tjidadapensis* (*J.J.S.*) *Carr*, and *S. tembelingensis, Carr*, would best be included under the section *Monanthochilus, Schltr.*, though, as Dr. J. J. Smith points out in *Bull. Jard. Bot. Buit. Sér. 2, XXVI* (*1918*) *83*, Dr. Schlechter describes the fleshy midlobe as a spur, but, while I have not seen Dr. Schlechter's plants, it seems that the structure of the flowers is otherwise the same as in the plants here discussed.

In his description of *S. virescens*, Ridley also describes the midlobe as a spur and the orange callus as the midlobe.

The callus is important from the point of view of pollination and it is gnawed by insects visiting the flower.

Sarcochilus tembelingensis, sp. nov. Caulis brevissimus, ascendens, basi radicans, c. 4-6-folius, c. ·80 cm. longus. Folia patentia, crasse carnosa, basi angustata et torta, lineari-lorata vel lanceolato-lorata, subfalcata, oblique inaequaliter bidentata, superne in utraque canaliculae mediae parte convexa, subtus apice excepto costa media conspicue elevata, c. 2·50 cms. longa, c. ·80 cm. lata, viridia, vaginis brevibus haud adpressis ad apicem accrescentibus, c. ·20 cm. longis. Inflorescentiae quam folia multo breviores, c. 6-florae, c. 1 cm. longae, pedunculo terete basi nonnullis vaginulis tubulosis apiculatis tecto. Bracteae alternatim bifariae, patentes, rachidem amplectentes, ovatae, marginibus erosulae, intus concavae, extus convexae, dorso valde incrassatae et apici in subulam brevem conicam productae, c. ·10 cm. longae. Flores intervallis singuli expansi, satis patentes, flavi. Sepalum dorsale oblongo-ellipticum, subacutum, basi suberectum, medio obtusangulariter incurvum, intus medio cucullate concavum, dorso carina media conspicue elevata, sparse et breviter pilosum, marginibus minute erosulum et supra minute ciliolatum, c. ·35 cm. longum, c. ·14 cm. latum. Sepala lateralia patentia, ultra medium pedis gynostemii decurrentia, oblonga, obtusa, basi curvula, sparse et breviter pilosa, intus concava, super medium paulo incurva, subtus convexa carina media conspicue elevata marginibus minute erosula et supra sparse et minute ciliolata, c. ·33 cm. longa, c. ·15 cm. lata. Petala oblongo-lanceolata, subobtusa, super medium cucullate incurva, intus medio valde concava, subtus obtusangulariter convexa, carina media satis conspicue elevata, rarissime et breviter pilosa, marginibus minute erosula, c. ·30 cm. longa, c. ·12 cm. lata. Labellum pedi gynostemii insertum eoque angulum obtusissimum faciens, unguiculatum, 3-lobum, ecalcaratum, flavum, c. ·35 cm. longum, explanatum trans lobos laterales c. ·60 cm. latum, inter lobos laterales saccatum, ungue brevissimo lato ad apicem dilatato c. ·03 cm. longo; lobi laterales oblongo-triangulares, obtusissimi, basi divergentes, medio erecti, apici paulo incurvi, papillosi, callo inter lobos carinam humilem simulante apici anguste lineari ad basin dilatato oblongo; lobus intermedius porrectus, triangulari-conicus, obtusus, supra convexus, subtus compressus, crasse carnosus, papillosus. Gynostemium breve, curvum, dorso ad apicem dilatatum, truncatum, papillosum, c. ·20 cm. longum; clinandrium concavum, carina longitudinali divisum; rostellum bilobum, lobis longis triangularibus acuminatis acutis; stigma magnum, suborbiculare, excavatum. Anthera cucullata, brevis, lata, longitudinaliter sulcata, transverse elliptico-oblonga, in rostrum breve

triangulare acutum producta, c. ·13 cm. longa, c. ·17 cm. lata. Pollinia 2, transverse ovalia, flava, inconspicue furcata; stipes linearis; glandula majuscula, triangulari-ovata. Pes gynostemii cum gynostemio angulum rectum faciens, quam gynostemium longior, linearis, basi carnosus apici tenuis papillosus. Ovarium 6-sulcatum, sparse furfuraceum. Capsula oblongo-cylindrica, c. 1 cm. longa, c. ·50 cm. lata.

Apparently closely allied to *Sarcochilus tjidadapensis* (*J.J.S.*) *Carr*, from Java, but differing in the longer stems, leaves and inflorescence, the form of the bracts, the sepals being minutely ciliolate, the side lobes and midlobe of the lip being entirely papillose as also the apex of the column and the column foot. As in *S. tjidadapensis* (*J.J.S.*) *Carr*, the flowers remain open for many days.

Described from a few plants collected and cultivated at Tembeling, Pahang. Flowered in February and March, and from August to November, 1928.

Sarcochilus (§ *Ascochilus*) **maculatus,** sp. nov. Caulis ascendens, basi radicans, c. 1·25–2 cm. longus, internodis brevibus. Folia c. 4–6, patentia, lineari-lorata, falcata, apici inaequaliter et acute biloba, crassiuscule coriacea, basi angustata et subtorta, supra utraque sulcae mediae parte leviter convexa, subtus utraque costae mediae conspicue elevatae parte leviter concava, grisei-viridia, ad 10 cms. longa, 1·50 cms. lata, vaginis basi tubulosis superne fissis marginibus infra apicem recurvum in lobulum rectangularem productis. Inflorescentiae e basi vaginae praesertim 2 superpositae emissae, erectae vel suberectae, pauciflorae; pedunculus teres, tenuis, apicem versus incrassatus, longiuscule muricatus, viridis sordide atrorubenti-suffusus, basi nonnullis vaginulis minimis et superne vaginula bracteiformi viridi sordide atrorubenti-suffusa c. ·30 cm. longa c. ·07 cm. lata donatus; rachis incrassata, breviter muricata, ad 1 cm. longa, ·15 cm. lata. Bracteae quaquaversae, crassiusculae, late ovatae, apiculatae apiculo conico-cylindrico, sparse verrucosae, marginibus erosulae, intus profunde concavae extus alte convexae, c. ·23 cm. longae, c. ·18 cm. latae, apiculo c. ·04 cm. longo. Flores intervallis singuli expansi, bene patentes. Sepala petalaque e basi valde reflexa, ocracea apice excepto purpureo-maculata. Sepalum dorsale oblanceolatum aut oblongum, obtusum, 3-nervium, extus carinatum praesertim sparse verrucosum, c. ·60 cm. longum, c. ·18 cm. latum. Sepala lateralia ad apicem pedis gynostemii decurrentia, e basi valde reflexa, subfalcata, oblonga, subacuta, margine antico praesertim leviter dilatata, 3-nervia, extus conspicue carinata, saepe sparse verrucosa, c. ·60 cm. longa, ·27 cm. lata. Petala bene patentia, falcata, lineari-oblanceolata, obtusa, 1-3-nervia, nervis exterioribus

brevibus, dorso satis conspicue carinata, c. ·55 cm. longa, c. ·15 cm. lata. Labellum apici pedis gynostemii adnatum et eum continuum, 3-lobum, calcaratum, lamina inter lobos laterales carnosa; lobi laterales basi divergentes, oblongi, dense papillosi, apici leviter rotundati, parte ¼ antica pallide flavi albive, partibus ¾ posticis dilute flavi striis transversis maculorum purpureorum ornati, c. ·30 cm. longi, c. ·17 cm. lati; lobus intermedius basi sulcatus, 3-lobus, lamina e basi ad apicem inter lobulos exteriores incrassatione triangulari donata, albus inter lobulos exteriores nonnullis maculis purpureis ornatus, lobulis exterioribus triangulari-oblongis obtusis dense papillosis c. ·15 cm. longis, lobulo intermedio multo breviore late triangulari acuto; calcar dependens, vix rectum, infra apicem dilatatum, dorso leviter compressum, papillosum, extus costis 5 elevatis intus sub fauce papillosum, flavum, c. ·37 cm. longum, c. ·25 cm. latum, c. ·18 cm. crassum. Gynostemium longiusculum, superne cucullatum, ad stigma abrupte dilatatum, dilute flavum, c. ·50 cm. longum; rostellum magnum, apici in rostrum triangulari-ovatum acutum productum; stigma magnum, ovale, profunde excavatum. Anthera cucullata, biloculata, apici in rostrum triangulari-ovatum acutum producta, flava, c. ·15 cm. longa. Pollinia 2 ovalia, subtus compressa, flava, stipiti filamentibus magnis distendentibus flavis conjuncta; stipes lineari-spathulatus, basi abrupte subulato-angustato, supra convexus, subtus concavus, apici recurvus, albus c. ·15 cm. longus; glandula triangularis, basi longe angustata, flava, c. ·04 cm. longa. Pes gynostemii cum gynostemio vix angulum rectum faciens, brevis, rectus, apici leviter retusus, purpureus, c. ·15 cm. longus. Ovarium 6-sulcatum, verruculosum, cum pedicello c. ·85 cm. longum. Capsula anguste lineari-cylindrica, viridis, c. 3 cms. longa, c. ·33 cm. diam.

This plant is closely allied to *S. appendiculatus*, *J.J.S.* from which, however, it is at once distinguished by the structure and markings of the lip. It occurs not uncommonly at Tembeling, Mentakab, Krambit, etc. in Pahang, and much more rarely in the Gemas district of Negri Sembilan, where it may be found growing together with *S. appendiculatus*, *J.J.S.* on small trees in the moister parts of the forest.

Described from living plants cultivated at Tembeling, Pahang.

Sarcochilus (§ *Ascochilus*) **appendiculatus**, *J.J.S. in Fl. Buit. VI* (*1905*) *and Atlas* (*1908*), *CDXXV*. As synonyms the following should be noted. *S. hirtulus, Hook. f. Fl. Brit. Ind. VI, 89*; *Ic. Pl. t. 2121. S. pusilla, Rchb. f. Walp. Ann. 500. Dendrocolla appendiculata, Bl. Bijdr. 289*; *Aerides pusillum, Lndl. Gen. and Sp. Orch. Pl. 241*; *Miq. in Fl. Ind.*

Bat. III, 697; *Grosourda appendiculata, Rchb. f. Xen. Orch. II, 123*; *Thrixspermum appendiculatum, O.K. Rev. Gen. Pl. II, 683*; *Ascochilus hirtulus, Ridl. in Journ. Linn. Soc. XXXII, 375*; *Mat. I, 178*; *Fl. Mal. Pen. IV, 181.*

Sarcochilus (§ *Ascochilus*) **ciliatus,** *J.J.S. in Bull. Jard. Bot. Buit. Sér. III, Vol. VIII (1926), liv, 1, 63*; *Dendrocolla ciliata ,Ridl. in Journ. Roy. As. Soc. Str. Br. XLIV, 192*; *Mat. I, 186*; *Fl. Mal. Pen. IV, 188*; *Thrixspermum blepharolobum, Schltr. in Engl. Bot. Jahrb. XLV, Beibl. 104 (1911), 58.* As Dr. J. J. Smith points out, *l.c.*, this plant should rightly be included in the genus *Sarcochilus*. In habit, inflorescence, column and pollinia it is entirely characteristic of the § *Ascochilus* in which it should be placed. The spur is represented by a shallow sac at the base of the lip.

Sarcochilus (§ *Ascochilus*) **fasciculatus,** sp nov. Caulis 2–6·50 cm. longus, apici c. 6-folius, inferne dense radicans, internodis brevibus. Folia patentia, oblanceolata vel lineari-lorata, valde oblique obtusa, carnosa, c. 7–11 cms. longa, 1-1·40 cms. lata, vaginis tubulosis siccis longitudinaliter rugulosis apici recurvis. Inflorescentiae fasciculatae, ad 10 super- et circum-positae, dimidium inferius vaginae folium pone perforantes et tuberculam magnam formantes, flores paucos vel ad 20 gignentes; pedunculus teres, gracillimus, apicem versus incrassatus, longe muricatus vel verrucoso-muricatus, 1–5 cms. longus, basi nonnullis vaginulis tubulosis et supra vaginulis 1–4 bracteiformibus donatus; rachis incrassata, ·30–·80 cm. longa. Bracteae quaquaversae, patentes, anguste triangulari-ovatae, obtusae, carnosae, intus concavae, extus convexae, c. ·10 cm. longae, c. ·07 cm. latae. Flores minimi, probabiliter intervallis ad 6 simul expansi. Sepalum dorsale lineari-oblanceolatum, sub apice breviter acuminatum, apici acutum, 3-nervium, c. ·28 cm. longum, c. ·08 cm. latum. Sepala lateralia haud ad pedem gynostemii decurrentia, oblonga, breviter apiculata, 3-nervia, c. ·28 cm. longa, c. ·11 cm. lata. Petala lineari-oblanceolata, acuta, 1-nervia, c. ·28 cm. longa, c. ·06 cm. lata. Labellum apici pedis gynostemii adnatum, 3-lobum, saccatum, ecalcaratum, explanatum e basi ad apicem lobi intermedii c. ·15 cm. longum, trans lobos laterales c. ·27 cm. latum; lobi laterales longissimi, curvuli, late lineares, apici rotundati, margine postico c. ·17 cm. longi, margine antico c. ·14 cm. longi, c. ·06 cm. lati; lobus intermedius 3-lobus, lobulis exterioribus brevissimis conicis subacutis carnosia c. ·04 cm. longis, lobulo interiore crasse carnoso anguste obtuso c. ·08 cm. longo totum c. ·10 cm. longum; saccus pedem gynostemii continuans, c. ·10 cm. longus, late conicus obtusus. Gynostemium vix rectum, apicem versus dilatatum, c. ·13 cm. longum, c. ·08 cm. latum; rostellum in

rostrum breve productum; stigma maximum, excavatum, subovale. Anthera cucullata. Pollinia 2, subovalia; stipes anguste linearis, apici triangulariter dilatatus. Pes gynostemii gynostemium aequans, linearis, c. ·13 cm. longus. Ovarium furfuraceum et sparse verrucoso-papillosum, c. ·40 cm. longum.

A curious plant with fascicled inflorescences, as many as 10 together, and very small flowers. It is remarkable also for the long column foot, as long as the column, the lateral sepals not adnate to the column foot, and for the reduction of the spur to a sac.

It is a true member of the section and is allied to *S. mentakabensis, Carr, S. decipiens, J.J.S.*, and *S. ciliatus, J.J.S.*, but the first mentioned is the nearest ally. The flowers are said to be yellow.

Described from 2 dried plants in the Singapore herbarium numbered 13286 and found growing on Angsana (*Pterocarpus indicus*) trees at Krian Road station, in Perak, by Mohammed Haniff on May 13th, 1924.

Sarcochilus (§ *Ascochilus*) **mentakabensis,** sp. nov. Caulis brevis, validus, ascendens, supra c. 5 folia ferens, basi radicans. Folia patentia, lorata, falcata, acuta, crassiuscule carnosa, apici oblique obtusa paulo recurva, basi leviter torta, supra utraque sulcae mediae parte convexa, subtus costa media inconspicua donata, vaginis internodos breves multo superantibus apici vix rectangulariter recurvis, flavescenti-viridia, ad c. 8 cms. longa, c. 1·70 cms. lata. Inflorescentiae e basi vaginae sub radicibus exeuntes, ad 3 superpositae, erectae vel suberectae; pedunculus teres, dense muricatus, muricibus oblongo-conicis apici pedunculi brevioribus et minoribus purpureis apici in glandulam linearem clavatam albam abrupte dilatatis, c. 3·50 cms. longus, apici leviter incrassatus c. ·10 cm. diam., basi nonnullis vaginulis parvis et supra 2, vaginula inferiore basi tubulosa supra late ovata obtusa intus concava extus convexa carina media conspicue elevata viridi basi purpureo-suffusa, vaginula superiore satis carnosa late ovata marginibus minute denticulata intus concava extus convexa papillosa carina media conspicue elevata viridi c. ·12 cm. longa et aequilata; rachis incrassata. Bracteae latae ovatae, acutae, intus concavae, extus convexae carina media conspicue elevata, virides c. ·15 cm. longae, c. ·13 cm. latae. Flores 1–3 simultanee expansi, per diem 1 viriditatem conservantes. Sepala petalaque patentia, tenuia, pellucide ocracea. Sepalum dorsale spathulato-oblanceolatum, supra breviter angustatum, apici anguste obtusum, super basin leviter reflexum, sub apice incurvum, 3-nervium, intus concavum, extus sparse verrucosum convexum carina media satis conspicua, c. ·50 cm. longum, c. ·20

cm. latum. Sepala lateralia vix ad pedem gynostemii decurrentia, super basin leviter reflexa, subfalcata, lanceolata, acuta, 3-nervia, intus concava, extus sparse verrucosa convexa carina media conspicua, margine postico fere medio late et rotundate dilatato, c. ·48–·55 cm. longa, c. ·25 cm. lata. Petala super basin reflexa, lineari-oblanceolata, acuta, supra falcate invurva, 1-nervia, apici cucullate incurva, intus concava, extus convexa carina media conspicue elevata, c. ·40 cm. longa, c. ·12 cm. lata. Labellum apici pedis gynostemii adnatum, 3-lobum, calcaratum, lamina canaliculis angustis 2 inter lobos laterales donatum, niveum, inter lobos laterales maculis 2 flavis ornatum, explanatum c. ·60 cm. longum, trans lobos laterales c. ·40 cm. latum; lobi laterales erecti, oblongi, apici rotundate curvuli, nivei, c. ·30 cm. longi, c. ·15 cm. lati; lobus intermedius carnosus, 3-lobus, lobis exterioribus carnosis conico-cylindricis acutis curvulis niveis c. ·10 cm. longis c. ·06 cm. latis, lobo intermedio carnoso e latere viso triangulari-oblongo truncato subtus compresso albo c. ·15 cm. longo c. ·07 cm. lato; calcar tenuissimum, rectum, anguste cylindricum, anguste obtusum, niveum, c. ·20 cm. longum, c. ·05 cm. latum. Gynostemium breve, rectum, oblongum, apici truncatum, basi angustatum, pallide flavescens, c. ·17 cm. longum, c. ·12 cm. latum; clinandrium excavatum, transverse semilunatum; rostellum magnum, in rostrum triangulari-ovatum acutum productum; stigma maximum, oblongum. Anthera conico-cucullata, supra visa quadrilateralis, flava, in rostrum brevissimum obtusum album producta. Pollinia 2 obovata subtus compressa, flava, ad stipitem filamentibus 2 brevibus distendentibus flavis conjuncta, stipite anguste lineari basi dilatato et apici abrupte spathulato-dilatato albo, glandula anguste oblonga alba. Pes gynostemii cum gynostemio angulum rectum faciens, linearis, basi carnosus, apici tenuis, albus, c. ·13 cm. longus, c. ·06 cm. latus. Ovarium 6-sulcatum, sparse verrucoso-papillosum, cum pedicello c. ·50 cm. longum.

An interesting species which in the development of the lip appears to come between *S. emarginatus, Rchb. f.*, from Java and Borneo in which the walls of the spur are much thickened with the cavity represented by a very narrow tube, and *S. decipiens, J.J.S.*, from Bali in which the 3-partite midlobe is very fleshy while the spur as such has almost disappeared, its position being marked by a very short and narrow fissure. In *S. mentakabensis, Carr*, the midlobe is 3-partite and fleshy, the spur being much reduced, slender and tapering to the narrow apex, while the cavity is reduced to the diameter of a slender hair.

Described from plants collected at Mentakab, Pahang,

and cultivated at Tembeling, where they flowered during September, October, and November, 1928.

Sarcochilus (§ *Ascochilus*) **siamensis,** comb. nov. *Ascochilus siamensis, Ridl. in Journ. Linn. Soc. XXXII, 375; Mat. I, 178; Fl. Mat. Pen. IV (1924) 181.* This member of the § *Ascochilus* is of great interest owing to the structure of the lip. The spur has been entirely suppressed while the midlobe is large, conic and very fleshy. It is one of the smallest plants of the section.

Chamaeanthus laciniatus, sp. nov. Caules breves, c. 5-8-folii, inferne radicantes, c. 2 cms. longi, internodis brevissimis c. ·10 cm. longis. Folia lorata, falcata, leviter carnosa, apici inaequaliter et acute biloba, basi leviter torta, supra obtusangulariter concava costa media leviter elevata, subtus convexa, pallide flavescenti-viridia, c. 3 cms. longa, c. ·80 cm. lata, vaginis internodos bene superantibus. Inflorescentiae e basi vaginae, brevissimae, erectae, dense multiflorae, pedunculo brevi terete ad ·20 cm. longo, rachide incrassata c. ·40 cm. longa. Bracteae quaquaversae, ovatae, mucronatae, apici papillosae, intus profunde concavae, extus convexae, c. ·25 cm. longae, c. ·11 cm. latae. Flores intervallis ad 4 simul expansi, vix aperti. Sepalum dorsale anguste lanceolatum, acuminatum, acutum, 1-nervium, intus concavum, extus utraque costae mediae elevatae parte convexum, pallide flavescens, dimidio inferiore utraque costae mediae parte nonnullis maculis aurantiacis ornatum, ·30–·40 cm. longum, ·09–·11 cm. latum. Sepala lateralia pedi gynostemii adnata, lineari-lanceolata, acuminata, acuta, margine postico super basin rotundate dilatata, 1-nervia, intus concava, extus convexa costa media elevata, pallide flavescentia, dimidio inferiore nonnullis maculis aurantiacis ornata, ·30–·40 cm. longa, c. ·11 cm. lata. Petala basi sepalis lateralibus breviter adnata, lanceolata, acuminata, acuta, 1-nervia, intus concava, extus convexa carina media elevata, pallide flavescentia, basi nonnullis maculis aurantiacis ornata, ·25–·30 cm. longa, ·08–·10 cm. lata. Labellum apici pedis gynostemii adnatum, 3-lobum, calcaratum, lamina inter lobos laterales elevata et sulca media brevi donata pallide flavescente sub lobis lateralibus aurantiaca, explanatum c. ·20 cm. longum, trans lobos laterales c. ·15 cm. latum; lobi laterales erecti, triangulari-ovati, falcati, acuti, margine postico late rotundate dilatato, margine antico praesertim laciniato, albidi basi aurantiaci, c. ·05 cm. longi, c. ·03 cm. lati; lobus intermedius quam lobos laterales bene longior, porrectus, oblongo-ovatus, medio carnosus, marginibus attenuatis profunde laciniatus, abrupte sub apice angustatus, apici in appendicem brevem subulatam productus, c. ·12 cm. longus, c. ·05 cm. latus; calcar breve, cum lamina angulum acutum faciens, pallide flavescens, c. ·03 cm. longum.

Gynostemium breve, erectum, super basin oblongo-dilatatum, basi abrupte angustatum, dorso productum apici triangulare obtusum, pallide flavescens, c. ·07 cm. longum; clinandrium triangulare, convexum; rostellum apici in rostrum productum, rostro magno triangulari subacuto carinato medio incurvo apici recurvo; stigma maximum, vix excavatum, oblongum, pallide flavescens striis 2 longitudinalibus aurantiacis ornatum. Anthera cucullata, 2-loculata, dorso profunde sulcata, apici in rostrum breviter triangulare acutum producta, pallide flavescens, super loculos macula magna aurantiaca ornata. Pollinia 2 magna, sulcata, oblonga, subtus valde compressa, pallide flavescentia, stipite anguste lineari apici subspathulate dilatato pallide flavescente, glandula minima oblonga flava. Pes gynostemii quam gynostemium brevior, intus convexus, aurantiacus, c. ·05 cm. longus. Ovarium breve, 6-sulcatum. Capsula anguste oblonga, apici basique angustata, c. ·60 cm. longa, c. ·18 cm. lata.

This species is of interest in that although it possesses a distinct spur it is none the less a true *Chamaeanthus* and is closely related to *Ch. flavus, Carr.*

Described from plants collected in Pahang at Mentakab and cultivated at Tembeling.

Chamaeanthus flavus, sp. nov. Caules breves, ascendentes, c. 5-folii, basi ramosi et radicantes, ad c. 2 cms. longi, internodis brevissimis. Folia patentia, linearilorata, falcata, satis carnosa, sub apice angustata, apici inaequaliter et acute bidentata, supra utraque sulcae mediae parte convexa, subtus utraque costae mediae inconspicuae parte leviter concava, flavescenti-viridia, c. 5·75 cms. longa, c. ·50 cm. lata, vaginis internodos multo superantibus apici recurvis marginibus sub apice recurvis. Inflorescentiae e basi vaginae, praesertim 2 vel plures superpositae, erectae, brevissimae, pauciflorae, pedunculo crasso, terete, ad c. ·35 cm. longo basi vaginulis c. 2 tubulosis, rachide breviore. Bracteae quaquaversae, late ovatae, mucronatae, marginibus erosulae, intus profunde concavae, extus alte convexae et carinatae, virides, c. ·16 cm. longae, c. ·10 cm. latae. Flores 1 aut plures simul expansi, vix aperti, per diem 1 viriditatem conservantes. Sepala subsimilia, basi abrupte dilatata, super basin anguste oblonga subparallelaque, superne longe acuminata, apici acuta incrassata, 1-nervia, intus concava, extus convexa, dorso incrassata et carinata, semipellucide flavescentia basi pallidiora. Sepalum dorsale c. ·37 cm. longum, c. ·09 cm. latum. Sepala lateralia pedi gynostemii brevissime adnata, subfalcata, c. ·42 cm. longa, c. ·10 cm. lata. Petala e basi abrupte valdeque dilatata, super basin ovato-oblonga, superne longe acuminata, apici acuta, 1-nervia, dimidio inferiore marginibus erosulis,

intus profunde acutangulariter concava, extus convexa carina media conspicue elevata, c. ·30 cm. longa, c. ·11 cm. lata. Labellum apici pedis gynostemii adnatum, mobile, porrectum, carnosum, inconspicue 3-lobum, ecalcaratum, 3-nervium, pallide flavescens, c. ·13 cm. longum, trans lobos laterales c. ·07 cm. latum; lobi laterales magni, suberecti, rotundati, marginibus breviter laciniati; lobus intermedius multo brevior, oblongus, retusus, lateraliter compressus, carnosus, c. ·04 cm. longus. Gynostemium vix rectum, apicem truncatum versus dilatatum, dorso apici in lobum breve rotundatum productum, pallide flavescens, c. ·10 cm. longum; clinandrium obcordatum, leviter convexum; rostellum angustum, brevissime triangulare; stigma profunde excavatum, basi oblongum, medio abrupte angustatum, superne lineari-oblongum. Anthera cucullata, profunde sulcata, supra visa transverse oblonga, pallide flavescens. Pollinia 2 subovalia, pallide flavescentia, stipite angusto apicem versus dilatato albo, glandula fusiformi rostellum brevissimum multo superante albo. Pes gynostemii quam gynostemium brevior eoque angulum rectum faciens, apici incurvus, basi sepalis lateralibus breviter adnatus. Ovarium breve, 6-sulcatum.

This is apparently allied to *Ch. brachystachys, Schlechter,* from Java and Borneo, but differs in the shorter inflorescence with a much shorter peduncle, the smaller and differently coloured flowers, the longer column, and the different caudicle of the pollinia.

The present plant and the last one are the first two species of the genus *Chamaeanthus* to be reported from the Peninsula.

Described from plants collected at Kerdau, Pahang, and cultivated at Tembeling.

Thrixspermum (§ *Orsidice*) **papillosum,** sp. nov. Caules erecti vel ascendentes, sectione transversa elliptici, lateraliter compressi, sordide virides c. 7–9 cms. longi, internodis ·70–1 cm. longis. Folia oblongo-elliptica, sub apice brevissime acuminata, apici inaequaliter obtuseque biloba et leviter recurva, crassiuscule carnosa, supra utraque sulcae mediae parte convexa et breviter transverse rugulosa, subtus costa satis conspicue elevata, basi leviter subtorta, nitidula, sordide viridia purpureo-suffusa et-punctata, c. 7.50 cms. longa, c. 1·75–2 cms. lata, vaginis tubulosis longitudinaliter rugosis subcarinatis colore foliorum. Inflorescentiae vaginam super basin et sub radicibus perforantes, porrectae vel suberectae, 30–40-florae; pedunculus leviter lateraliter compressus, apicem versus incrassatus, vaginulis c. 3 tubulosis donatus, viridis omnino sordide purpureo-suffusus, c. 2–4 cms. longus; rachis incrassata, valde lateraliter compressa, c. 6 cms. longa vel longior, cum bracteis c. ·70 cm.

lata, absque bracteis c. ·27 cms. lata, internodis latere excavatis c. ·20 cm. longis. Bracteae alternatim bifariae, erecto-patentes, basi rachidem amplectantes, valde lateraliter compressae, parte libera triangulari acuta valde carinata, dorso parallelae, nitide virides sordide purpureo-suffusae et punctatae, c. ·50 cm. longae, parte libera c. ·20 cm. longa. Flores singuli vel 2 simul expansi, per diem 1 durantes. Sepala petalaque patentissima, semipellucide pallide ochrea, ecaudata. Sepalum dorsale anguste lineari-lanceolatum, acutissimum, 5-nervium, intus concavum sub apice acutangulariter concavum, extus convexum sparse verrucosum, rare minute papillosum, c. 2·75 4 cms. longum, c. ·33–·37 cm. latum. Sepala lateralia pedi gynostemii adnata, subulata, subfalcata, apici acuta, basi leviter torta, minute papillosa, extus sparse verrucosa, c. 2·80–4 cms. longa, c. ·33–·37 cm. lata. Petala linearia vel anguste lineari-oblanceolata, medio saepe leviter dilatata, sub apice angustata, apici acutissima, intus concava, extus convexa minute papillosa, c. 2·50–3·75 cms. longa, c. ·17–·20 cm. lata. Labellum apici pedis gynostemii adnatum, 3-lobum, profunde saccatum, basi lobi intermedii callo lamelliformi oblongo cucullate curvulo papilloso apici truncato recurvo albido purpureo-maculato donatum, explanatum c. 1 cm. longum, trans lobos laterales c. ·75–·83 cm. latum; lobi laterales basales, erecti, oblongi, valde falcati, apici recurvi et truncati, intus dense minute pilosi sub apice papillosi, extus dense papillosi, marginibus ciliolati, albidi basi flavescentes nonnullis maculis violaceis et cinnamomeis ornati, c. ·15 cm. lati, margine antico c. ·15–·20 cm. longo; lobus intermedius cum sacco fere angulum obtusum faciens, porrectus, crasse carnosus, basi excavatione lata triangulari pilosa donatus, superne late conicus, apici obtusissimus, supra rotundate dilatatus et subcarinatus, subtus compressus, omnino dense minute pilosus, dimidio inferiore pallide ochreus cinnamomeo-maculatus, dimidio superiore niveus, c. ·40 cm. longus, c. ·25 cm. diam.; saccus pendulus, pedem gynostemii continuans, oblongo-conicus, apici obtusissimus, intus carina media ex apice sacci ad callum donatus medio utraque carinae parte pilosus, intus extusque dense papillosus, pallide ochreus cinnamomeo- et purpureo-maculatus, c. ·30 cm. longus et aequilatus. Gynostemium breve, rectum, albidum, basi maculis purpureis 1–2 ornatum, c. ·15 cm. longum; clinandrium suborbiculare, medio in gibbam conicam elevatum, apici profunde concavum et carina brevi donatum, basi concavum; stigma minimum, profunde excavatum, suborbiculare, basi in lobulum brevem rotundatum instructum. Anthera cucullata, biloculata, supra sulcata, basi intus lamellis tenuibus 2 suborbicularibus donata, apici in rostrum brevissimum latum truncatum producta, supra visa subquadrata sub apice dilatata, alba,

c. ·10 cm. longa. Pollinia 4 inaequalia, in corpusculis 2 oblongis extus rotundate curvulis intus compressis conjuncta, pallide flavescentia, antica c. ·05 cm. longa, postica c. ·03 cm. longa; stipes magnus, oblongus, apici leviter rotundatus, super basin erectus et polliniis adpressus, albus; glandula parva, apici in lobulos 2 lineares obtusos producta, sinu inter lobulos lato. Pes gynostemii quam gynostemium leviter latior et eocum angulum obtusum faciens, apicem versus dilatatus, pallide flavus cinnamomeo et purpureo-maculatus, basi papillosus, c. ·18 cm. longus, c. ·20 cm. latus. Ovarium 6-sulcatum, flavo-viride, cum pedicellum c. 1 cm. longum.

This plant is of the same affinity as *Th. lampongense, J.J.S.*, from Sumatra, of which it may be a regional variety. It differs, however, from the description in *Bull. Jard. Bot. Buit. Sér. 2, XXV (1917) 89*, in the shorter stems, the shorter internodes of the rachis, the smaller bracts, the sepals sparsely warty on the outside and minutely papillose, the differently coloured, ciliolate and minutely pilose side-lobes of the lip, the minutely pilose midlobe and the papillose, inside keeled, sac. The base of the column foot is also papillose. Very variable in the size of the flower.

Pahang, Kuala Teku, and Semangko Pass at about 3,000 feet elevation.

Described from living plants cultivated at Tembeling, Pahang.

Thrixspermum (§ *Orsidice*) **lilacinum,** *Rchb. f. Xen. Orch, II, 121, etc.* The name should be changed to **Th. amplexicaule,** *Rchb. l.c.*

Thrixspermum (§ *Orsidice*) **notabile,** *Ridl. in Journ. Linn. Soc. XXXII, 379, etc.* This is a synonym of, and should be changed to **Th. acuminatissimum,** *Rchb. f. Xen. Orch. II, 121.*

Thrixspermum (§ *Dendrocolla*) **brevicaule,** sp. nov. Caulis brevis, validus, sectione transversa ovalis, c. 2–4 cms. longus, c. ·20–·25 cm. diam. Folia pauca, patentia vel subpatentia, recurva vel recta, anguste lineari-lanceolata, apici obliqua, basi angustata, c. 3–5·70 cms. longa, c. 1–1·50 cms. lata, dilute viridia, supra sulca media donata, subtus carinata, vaginis tubulosis longitudinaliter sulcatis et leviter transverse rugulosis. Inflorescentiae basin vaginae perforantes, erectae vel suberectae, quam folia multo longiores; pedunculus validus, rigidus, teres, c. 5–12 cms. longus, c. ·10 cm. diam., vaginulis c. 3 basi tubulosis apici libris et apiculatis; rachis quam pedunculum multo longior, dense multiflora, c. 1·33–1·75 cms. longa, c. ·30–·35 cm. diam. Bracteae quaquaversae, patentes, rachidem semiamplectantes, triangulares, valde carnosae, marginibus incurvis. Flores intervallis 1–3 simul expansi, flavi, maculis striisque

castaneis ornati, c. 1·50 cms. lati. Sepala petalaque patentia. Sepalum dorsale basi unguiculate constrictum, lamina oblongo-elliptica obtusa vel breviter apiculata, intus concavum, subtus convexum, costa media elevata, nervis 3 cum nerva 1 breviore utrinque, nervis apici furcatis, totum c. ·77 cm. longum, c. ·47 cm. latum, ungue c. ·15 cm. longo c. ·17 cm. lato, flavum, lamina maculis castaneis ornatum. Sepala lateralia ad pedem gynostemii decurrentia, basi oblique unguiculata, lamina oblongo-elliptica, obtusa vel apiculata, margine antico fere medio in lobulum triangularem obtusum rotundate dilatata, nervis 5 apici furcatis, subtus costa media elevata, tota c. ·82 cm. longa, c. ·60 cm. lata, flava, lamina maculis castaneis ornata, ungue c. ·20 cm. longo, c. ·25 cm. lato. Petala quam sepala minora, e basi unguiculate constricta late oblique spathulata, obtusa, 3-nervia nervis apici furcatis, e basi valde reflexa, intus concava, subtus convexa, c. ·70 cm. longa, c. ·40 cm. lata, ungue c. ·20 cm. longo c. ·12 cm. lato, colore sepala simulantia. Labellum pedi gynostemii adnatum, 3-lobum, basi profunde saccatum, totum explanatum ad apicem lobi intermedii c. ·80 cm. longum, trans lobos laterales c. ·90 cm. latum; lobi laterales magni, erecti, gynostemium bene superantes et eum vix celantes, oblongi, apici rotundati, dense clavato-pilosi, margine postico rotundato et incurvo, c. ·40 cm. longi, pallide flavescentes, nonnullis maculis castaneis ornati; lobus intermedius rotundate triangularis, subacutus, dense clavato-pilosus, basi c. ·27 cm. latus, c. ·10 cm. longus; saccus basin pedis gynostemii continuans, cum lamina vix angulum rectum faciens, oblongus, obtusus, leviter incurvus, apici medio longitudinaliter sulcatus, c. ·35 cm. longus, intus pauce clavato-pilosus, apici macula magna rubro-castanea ornatus, carina media lineari dense clavato-pilosa apici dilatata inter lobos laterales in callo terminante; callus laminam tenuem cucullatam simulans, apici retusus, dorso excepto dense clavato-pilosus, albidus, apici macula media castanea ornatus. Gynostemium breve, latum, rectum, absque pede c. ·17 cm. longum, alis rotundatis e basi dilatatis apici abrupte in dentem subulatum incurvum constrictis, clinandrio leviter concavo carina media humili elevato apici bilobo. Anthera cucullata, satis compressa, medio sulcata, alba, c. ·08 cm. longa. Pollinia 4 inaequalia, ovato-oblonga, apici rotundata, anteriora majora, intus ad apicem excavata, posteriora minora intus compressa extus convexa, flava, stipite triangulari-ovato acuto albo, glandula parvula flavescente. Pes gynostemii cum gynostemio angulum rectum faciens, linearis, leviter concavus, marginibus medio leviter constrictis, c. ·33 cm. longus. Ovarium 6-sulcatum, viridi-flavescens. Capsula linearis, subcylindrica, c. 6·50 cms. longa.

This plant is allied to *Thrixspermum pardalis, Carr*, from which it is, however, readily distinguished by the much more fleshy bracts, the less hairy lip, the differently coloured markings, etc.

Pahang, Tembeling and Krambit, on small trees rather scarce, also at Kuala Teku on a small tree overhanging the river.

Described from living plants cultivated at Tembeling, Pahang.

Thrixspermum (§ *Dendrocolla*) **pardalis**, new comb. *Dendrocolla pardalis, Ridl. Journ. Linn. Soc. XXXII, 382; Fl. Mal. Pen.* IV (*1924*) *187*; *Sarcochilus pardalis, Ridl. in Trans. Linn. Soc. II, 371*; *S. recurvus, Hook. f. Fl. Brit. Ind. VI* (*1890*) *39*; *Ic Pl.* (*1894*) *2122*. A very common plant in Pahang, both on orchard and forest trees.

Thrixspermum (§ *Dendrocolla*) **album**, new comb. *Dendrocolla alba, Ridl. in Journ. Roy. As. Soc. Str. Br. XLIV, 191*; *Mat. I* (*1907*) *185*; *Fl. Mal. Pen. IV* (*1924*) *188*. I must record this plant from Tembeling, Pahang, on bushes and small trees in gardens and kampongs. It is a very local plant.

Thrixspermum (§ *Dendrocolla*) **rubrocallosum**, sp. nov. Caulis suberectus vel ascendens, sectione transversa ellipticus, c. 5–10 cms. longus, c. ·20–·30 cm. latus, internodis c. ·50 cm. longis. Folia patentia, lineari-lorata vel linearioblanceolata, carnosa, apici inaequaliter acuteque biloba, subtus carinata, c. 3–8 cms. longa, ·70–1·30 cms. lata, dilute viridia, saepe rubro-maculata vel-suffusa, vaginis tubulosis. Inflorescentiae erectae suberectaeve, vaginam infra radices perforantes; pedunculus teres, ad summam leviter dilatatus, 2–6 cms. longus, viridi-flavescens, saepe rubro-maculatus vel suffusus, basi vaginulis c. 3, basilaribus 2 tubulosis, superiore basi tubulosa sub apice libra erecta subacuta concava marginibus incurvis contiguisque; rachis quam pedunculum crassior, c. 1–1·80 cms. longa, c. ·20 cm. diam. Bracteae quaquaversae, carnosae, basi late ovatae, superne abrupte in laminam subulatam erectam angustatae, intus concavae, extus convexae, carina media conspicue elevata. Flores intervallis 1 vel plures simul expansi, per diem 1 durantes, valde expansi, nivei, c. 1·5–1·8 cms. lati. Sepala petalaque e basi reflexa. Sepalum dorsale oblanceolatum apice incrassato apiculato vel incurvo, 5-nervium, extus costa media inconspicue elevata donatum, c. ·60–80 cm. longum, 3. ·25–·30 cm. latum. Sepala lateralia pedi gynostemii adnata, recta vel subfalcata, lineari-lanceolata, apiculata, vel apici incurva, 5-nervia, margine antico super basin rotundate dilatato, intus leviter concava, extus leviter convexa, costa media elevata, c. ·76–1 cm. longa, ·25–·30 cm. lata. Petala anguste lineari-oblanceolata

vel linearia, margine antico dimidio superiore leviter rotundato, quam sepala multo angustiora, 3-nervia, basi leviter unguiculate constricta, apici incrassata et abrupte incurva, extus costa media elevata, c. ·60–·80 cm. longa, c. ·15 cm. lata. Labellum basi pedis gynostemii insertum, 3-lobum, basi profunde saccatum; lobi laterales magni, erecti, incurvi, oblongi, apici rotundati, marginibus posticis late rotundatis incurvis gynostemium superantibus et super eum fere contiguis, marginibus dense intus sparse clavato-pilosi, c. ·60 cm. longi, ·20 cm. lati, callo inter lobos laminam oblongam retusam facie postico albam facie antico medio atrorubro-maculatam simulante; lobus intermedius quam lobos laterales multo longior, subulatus, basi obtusangulariter recurvus, dimidio superiore incurvus cum lamina angulum rectum vel obtusum faciens, marginibus dense intus sparse clavato-pilosus, ad c. ·45 cm. longus, basi ad c. ·25 cm. latus; saccus oblongo-conicus, truncatus, subretusus, apici leviter incurvus, intus basi macula castanea ornatus et carina media in callo inter lobos laterales terminante, totus c. ·25–·30 cm. longus. Gynostemium breve, latum, vix rectum, superne leviter angustatum, alis brevibus rotundatis obtusis; clinandrium orbiculare, excavatum; stigma suborbiculare, alte excavatum; rostellum breve, apici bilobum. Anthera cucullata, retusa, longitudinaliter sulcata, marginibus obtusangulariter rotundatis, alba. Pollinia 4, in corpusculis 2 compressa, corpusculis e latere visis lineari-obovatis apici rotundatis intus compressis vel leviter excavatis, dilute flava, stipite magno ovato obtuso, glandula brevi et lata.

Remarkable for the long midlobe of the lip which is usually upcurved in the upper half, but is sometimes porrect or even with the upper half decurved.

A form occurs, though rarely, in which the sepals, petals and lip are strongly tinted violet.

Pahang, Tembeling, Krambit, Mentakab, etc., not uncommon, and much more rarely in the Gemas district of Negri Sembilan. In the Singapore herbarium there are some plants of this species labelled *Dendrocolla*, *sp.* and collected at Kuching, Sarawak.

Described from living plants cultivated at Tembeling, Pahang.

Gastrodia Holttumii, sp. nov. Rhizoma breve, horizontale, initio teres, deinde tuberiforme, carnosum, subtus et dorso compressum, saepe intervallis valde constrictum, internodis ·15 ·2 cm. longis, nodis nonnullis vaginis parvis subulatis donatis. Inflorescentiae erectae, 1-4-florae, pedunculo terete c. 6–10 cms. longo c. ·275 cm. diam. albido vaginulis c. 4–5 donato, rachide terete verrucosa c. 2–4 cms. longa, purpurea. Bracteae patentes, ovatae, acutae, c. ·25–·35 cm. longae, c. ·20 cm. latae. Flores nutantes, cam-

panulati, vix aperti, succedanei, per diem 1 durantes. Sepala petalaque ad medium sepalorum adnata, carnosa, pallide flavo-brunea, sepalis extus verrucosis. Sepalum dorsale totum c. 2 cms. longum; pars libra ovato-oblonga, apici leviter biloba, marginibus supra attenuata, intus concava, extus convexa et carinata, c. 1 cm. longa, basi c. 1·25 cm. lata. Sepala lateralia intus incrassatione media lata conico-elevata pallide carnea donata, tota c. 2 cms. longa; pars libra falcate curvula, transverse et truncate oblonga, marginibus attenuata et incurva, intus profunde concava, extus alte convexa et carinata, c. 1 cm. longa, explanata c. 1·25 cms. lata. Petala parte libra minuta, oblongo-ovata obtusa c. ·10 cm. longa c. ·07 cm. lata. Labellum apici pedis gynostemii adnatum, porrectum, sigmoideum, unguiculatum, pallide flavescens apici flavum, explanatum c. ·30 cm. longum, c. ·18 cm. latum; unguis brevis et latus, callis 2 rotundatis transverse ovalibus donatus; lamina oblonga, breviter acuminata, obtusa, subtus convexa, supra concava? carina media magna subpanduriformi haud apicem attingente apici biloba lobis brevibus angustis conico-elevatis. Gynostemium breve, leviter curvulum, apicem versus lateraliter compressum, dorso in lobum triangulare obtusum productum, alis longis rotundatis apici in lobum subulatum carnosum exeuntibus, totum c. ·37 cm. longum; rostellum apici in rostrum triangulare subacutum instructum; stigma basi gynostemii insertum, transverse ovale. Anthera cucullata, suborbicularis, apici truncata et laciniata, extus compressa elevatione media late triangulari-ovata donata. Pollinia 2 ovalia, intus compressa, rubro-flava, granulis inaequimagnis filamentibus viscidis conjunctis, basi nonnullis granulis minimis in formam glandulae suborbicularis similiter conjunctis. Pes gynostemii cum gynostemio angulum rectum faciens, breve, rectum. Ovarium 6-sulcatum, abrupte dilatatum, c. ·20 diam., cum pedicello c. ·75 cm. longum, purpureum. Capsula cylindrica, viridi-purpurea, c. 2 cms. longa, c. ·75 cm. diam., pedicello elongato ad c. 40 cms. longo.

A leafless saprophyte. It is remarkable for the very small petals, column and lip, and for the great elongation of the pedicel as the capsule ripens. Normally the flowers appear just above the fallen leaves on the ground in shady forests and they are most difficult to observe.

The elongation of the pedicel ensures the dispersal of seed to much greater distances than would otherwise be possible, while during flowering the plant is rendered inconspicuous and thus less liable to attack. This species does in fact establish itself in colonies occupying a larger area than is the case with many terrestrial orchids of the same size. The elongate pedicels are hollow and very

brittle. Under natural conditions a large percentage of capsules are formed.

The plant is often self-fertilized in the following manner. The anther, after the flower has been open for some time, is gradually raised by the shrinking of the filament. The pollinia are raised with the anther quite clear of the clinandrium. Slight friction is now sufficient to dislodge them and they fall either direct upon the stigma or rebound upon it from the lip and fertilization results.

This plant is perhaps nearest to *G. crispa, J.J.S.* from Java, in which species according to Dr. Smith the pedicel elongates to 6·3 cms.

Described from living plants collected and cultivated at Tembeling, Pahang, and flowering in March and April, 1928.

Gastrodia javanica, *Endl. Gen. Pl. 212*; *Lndl. Gen. and Sp. Orch. 384*; *Epiphanes javanica, Bl. Bijdr. 421, f. IV.* The following should be added as a synonym. *G. malayana, Ridl. Mat. I, 207*; *Fl. Mal. Pen. IV, 207.* According to Dr. J. J. Smith's figure in *Atlas, No. L.*, and the description in *Fl. Buit. VI, 75*, the Malayan plant appears to be identical with the Javan.

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PLATE I.

Fig. A.—**Oberonia suborbicularis,** *Carr.*

1. Plant.
2. Flower, face view.
3. Lower bract.
4. Upper bract.
5. Upper sepal.
6. Lateral sepal.
7. Petal.
8. Lip, spread out.

1. Nat. size; Nos. 2–8 enlarged.

Fig. B.—**Liparis tembelingensis,** *Carr.*

1. Flower, side view with lip in section.
2. Bract.
3. Upper sepal.
4. Petal.
5. Lateral sepal.
6. Column, apex, from below.
7. Lip, spread out.
8. Lip, upper half from above.
9. Lip, lower half from above.
10. Anther, from above.

All enlarged.

PLATE II.

Dendrobium quadrangulare, *Par.*

1. Plant.
2. Flower, from below.
3. Apex of lip from above.
4. Column, from below.
5. Pollinia.
6. Section of upper internode of stem.
7. Upper sepal.
8. Petal.
9. Lateral sepal.
10. Lip, spread out.

Nos. 1, 6, 10 nat. size; Nos. 2–5, 7–9 enlarged.

PLATE III.

Fig. A.—**Dendrobium salaccense,** Lndl.

1. Flower, from below.
2. Flower, from the side, upper sepal, lateral sepal and petal removed.
3. Lip, spread out.
4. Upper sepal.
5. Petal.
6. Lateral sepal.
7. Pollinia.
8. Column, from below.

9. Anther, from above.
10. Anther, from below.

Nos. 1, 4–6 nat. size; 2, 3, 7–10 enlarged.

Fig. B.—**Dendrobium setifolium,** Ridl.

1. Flower, from front.
2. Flower, lateral section.
3. Upper sepal.
4. Petal.
5. Lateral sepal.
6. Column, from below.
7. Lip, spread out.

Nos. 3–5 nat. size; Nos. 1, 2, 6, 7 enlarged.

Fig. C.—**Sarcostoma javanica,** *Bl.*

1. Plant.
2. Flower, from front.
3. Flower, lateral section.
4. Upper sepal.
5. Petal.
6. Lateral sepal.
7. Anther, from above.
8. Anther, from below.
9. Lip, spread out.
10. Pollinia.
11. Column from below.

No. 1 nat. size; remainder enlarged.

PLATE IV.

Fig. A.—**Dendrobium quadrilobatum,** *Carr.*

1. Flower, from front.
2. Upper sepal.
3. Petal.
4. Lateral sepal.
5. Lip, from behind.
6. Lip, spread out.
7. Lip, oblique view.
8. Column, from side.

All enlarged.

Fig. B.—**Dendrobium inconspicuiflorum.** *J.J.S*

1. Portion of stem.
2. Flower, from below.
3. Flower, from side.
4. Upper sepal.
5. Lateral sepal.
6. Petal.
7. Column, from below.
8. Lip, spread out.
9. Column, from side.

All enlarged.

Fig. C.—**Bulbophyllum mobilifilum,** *Carr.*

1. Flower, from front.
2. Flower, from side.
3. Upper sepal.
4. Lateral sepal.
5. Cross section of sepal.
6. Petal.
7. Lip, from the side.
8. Base of lip, from below.
9. Base of lip, from above.
10. Apex of column, from below.
11. Column, from the side.

Nos. 1, 2 nat. size; remainder enlarged.

PLATE V.

Fig. A.—**Bulbophyllum papillosofilum,** *Carr.*

1. Flower, from the front.
2. Flower, from the side.
3. Upper sepal.
4. Lateral sepal.
5. Petal.
6. Lip, from the side.
7. Base of lip, from below.
8. Base of lip, from above.
9. Column, from the side.

Nos. 1, 2 nat. size; remainder enlarged.

Fig. B.—**Bulbophyllum trichoglottis,** *Ridl.*

1. Plant.
2. Flower, from the front.
3. Flower, lateral section.
4. Upper sepal.
5. Petal.
6. Lateral sepal.
7. Lip, spread out.
8. Column, from the side.
9. Anther, from above.
10. Pollinia.
11. Pollinia.

No. 1 nat. size; remainder enlarged.

PLATE VI.

Bulbophyllum geminatum, *Carr.*

1. Plant.
2. Lip and column, from the side.
3. Bract.
4. Upper sepal, from the side.
5. Upper sepal, from the front.

6. Petal.
7. Lateral sepal.
8. Lip, from the side.
9. Anther, from the side.
10. Pollinia, from the side.

Nos. 1, 4, 5, 7 nat. size; Nos. 2, 3, 6, 8–10 enlarged.

PLATE VII.

Fig. A.—**Bulbophyllum minimibulbum,** *Carr.*

1. Plant.
2. Flower, from the front.
3. Flower, from the side.
4. Bract.
5. Upper sepal.
6. Lateral sepal.
7. Petal.
8. Lip, spread out.

No. 1 nat. size; remainder enlarged.

Fig. B.—**Eria atrovinosa,** *Carr.*

1. Flower, lateral section.
2. Flower, from the front.
3. Bract.
4. Upper sepal.
5. Lateral sepal.
6. Petal.
7. Lip, spread out.
8. Apex of column, from below.
9. Anther from above.
10. Pollinia, from below.

Nos. 2–6 nat. size; 1, 7–10 enlarged.

PLATE VIII.

Phalaenopsis appendiculata, *Carr.*

1. Plant.
2. Flower, from the front.
3. Bract.
4. Upper sepal.
5. Lateral sepal.
6. Petal.
7. Lip, spread out.
8. Flower, lateral section.
9. Anther, from above.
10. Anther, from below.
11. Pollinia, from below.
12. Pollinia, from the side.
13. Base of caudicle and disc.

No. 1 nat. size; remainder enlarged.

PLATE IX.

Saccolabium Hendersonii, *Carr.*

1. Plant.
2. Flower, from the front.
3. Flower, lateral section.
4. Upper sepal.
5. Petal.
6. Lateral sepal.
7. Apex of column, from below.
8. Pollinia, from below.
9. Pollinia, from the side.
10. Anther, from below.

No. 1 nat. size; remainder enlarged.

PLATE X.

Fig. A.—**Ascochilopsis myosurus,** *Carr.*

1. Plant.
2. Flower, from the front.
3. Flower, lateral section.
4. Portion of the peduncle.
5. Bract.
6. Upper sepal.
7. Lateral sepal.
8. Petal.
9. Lip, from above.
10. Anther, from below.
11. Pollinia, from above.
12. Pollinia, from the side.

No. 1 nat. size; remainder enlarged.

Fig. B.—**Sarcochilus virescens,** *Ridl.*

1. Plant.
2. Flower, lateral section.
3. Upper sepal.
4. Lateral sepal.
5. Petal.
6. Lip, from above.
7. Bract, from below.
8. Anther, from above.
9. Caudicle and disc, from above.

No. 1 nat. size; remainder enlarged.

PLATE XI.

Fig. A.—**Sarcochilus tembelingensis,** *Carr.*

1. Plant.
2. Flower, from the front.
3. Flower, lateral section.

4. Lip, lateral section.
5. Upper sepal.
6. Petal.
7. Lateral sepal.
8. Flower, from above.
9. Column, from below.
10. Anther, from below.
11. Anther, from above.
12. Pollinia, from above.

No. 1 nat. size; remainder enlarged.

Fig. B.—**Sarcochilus siamensis**, *Carr.*

1. Plant.
2. Flower, from the front.
3. Flower, lateral section.
4. Upper sepal.
5. Petal.
6. Lateral sepal.
7. Anther, from above.
8. Anther, from below.
9. Pollinia, from above.

No. 1 nat. size; remainder enlarged.

PLATE XII.

Fig. A.—**Sarcochilus maculatus**, *Carr.*

1. Plant.
2. Flower, lateral section.
3. Upper sepal.
4. Lateral sepal.
5. Petal.
6. Lip, spread out, from above.
7. Bract.
8. Anther, from below.
9. Pollinia, from above.

No. 1 nat. size; remainder enlarged.

Fig. B.—**Sarcochilus mentakabensis**, *Carr.*

1. Plant.
2. Flower, from front.
3. Flower, lateral section.
4. Bract, from below.
5. Bract, from above.
6. Upper sepal.
7. Lateral sepal.
8. Petal.
9. Portion of peduncle.
10. Lip, from above.
11. Lip, from the side.

12. Anther, from the side.
13. Anther, from above.
14. Pollinia, from above.

No. 1 nat. size; remainder enlarged.

PLATE XIII.

Fig. A.—**Sarcochilus ciliatus,** *J.J.S.*

1. Plant.
2. Flower, lateral section.
3. Upper sepal.
4. Lateral sepal.
5. Petal.
6. Lip, spread out, from above.
7. Anther, from the side.
8. Anther, from above.
9. Column, from below.
10. Pollinia, from above.

No. 1 nat. size; remainder enlarged.

Fig. B.—**Thrixspermum papillosum,** *Carr.*

1. Flower, from below.
2. Flower, lateral section.
3. Lip, spread out, from above.
4. Upper sepal.
5. Lateral sepal.
6. Petal.
7. Anther, from the side.
8. Anther, from above.
9. Column, from below.
10. Pollinia, from the front.
11. One pair of pollinia, from behind.
12. Caudicle and disc, from behind.
13. Caudicle, from the front.

Nos. 1, 4–6 nat. size; Nos. 2, 3, 7–13 enlarged.

PLATE XIV.

Fig. A.—**Sarcochilus fasciculatus,** *Carr.*

1. Portion of stem, with insertion of inflorescences.
2. Upper sepal.
3. Lateral sepal.
4. Petal.
5. Bract.
6. Lip, spread out, from above.
7. Lip and column, from the side.
8. Pollinia with caudicle.

No. 1 nat. size; remainder enlarged.

Fig. B.—**Sarcanthus Holttumii**, *Carr.*

1. Bract.
2. Upper sepal.
3. Lateral sepal.
4. Petal.
5. Lateral sepals and lip petal, from behind.
6. Lip, spread out, from above.
7. Lip, longitudinal section.
8. Callus.
9. Anther, from above.
10. Pollinia, from below.

All enlarged.

PLATE XV.

Thrixspermum brevicaule, *Carr.*

1. Plant.
2. Flower, from front.
3. Upper sepal.
4. Lateral sepal.
5. Petal.
6. Lip, spread out, from above.
7. Column, from below.
8. Flower, lateral section.

Nos. 1, 3–5 nat. size, Nos. 2, 6–8 enlarged.

PLATE XVI.

Thrixspermum rubrocallosum, *Carr.*

1. Plant.
2. Flower, from front.
3. Flower, lateral section.
4. Upper sepal.
5. Lateral sepal.
6. Petal.
7. Lip, spread out, from above.
8. Column, apex, from below.
9. Clinandrium with pollinia.
10. Anther, from below.
11. Anther, from above.
12. Pollinia, from the front.
13. Pollinia, from the side.

No. 1 nat. size; remainder enlarged.

PLATE XVII.

Fig. A.—**Chamaeanthus laciniatus**, *Carr.*

1. Plant.
2. Flower, lateral section.
3. Bract.
4. Upper sepal.

5. Lateral sepal.
6. Petal.
7. Anther, from above.
8. Column, from below.
9. Pollinia, from above.
10. Lip, spread out, from above.

No. 1 nat. size; remainder enlarged.

Fig. B.—**Chamaeanthus flavus,** *Carr.*

1. Plant.
2. Flower, lateral section.
3. Bract.
4. Upper sepal.
5. Lateral sepal.
6. Petal.
7. Lip, lateral section.
8. Lip, spread out, from above.
9. Column, from below.
10. Pollinia, from above.

No. 1 nat. size; remainder enlarged.

PLATE XVIII.

Gastrodia Holttumii, *Carr.*

1. Plant.
2. Plant.
3. Flower, from the front.
4. Flower, lateral section.
5. Sepal and petals, spread out.
6. Lip, spread out, from above.
7. Column, from below.
8. Anther, from below.
9. Lip and column, from the side.
10. Pollinia, from below.
11. Pollinia, from the side.

Nos. 1, 2, 4, 5 nat. size; Nos. 3, 6–11 enlarged.

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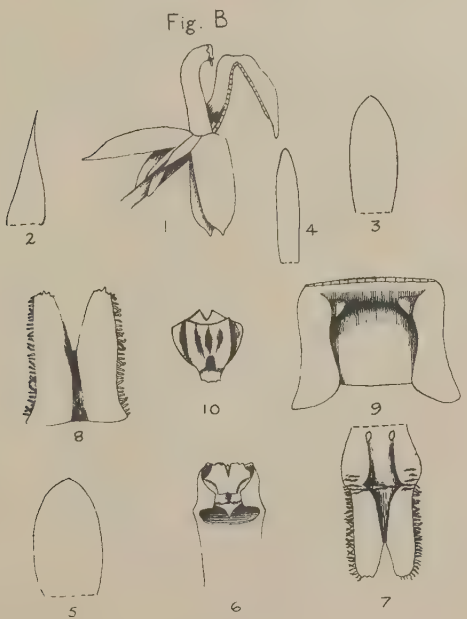
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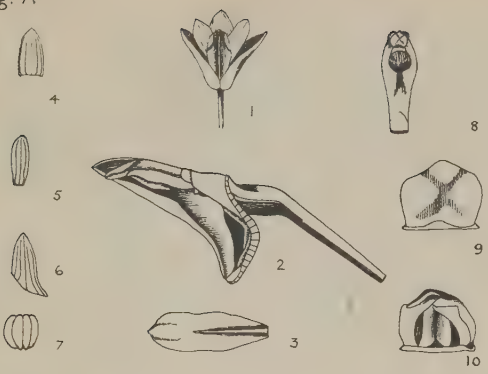
Fig. A



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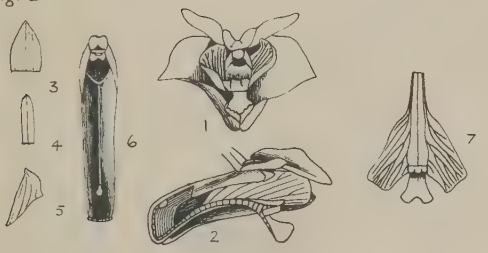

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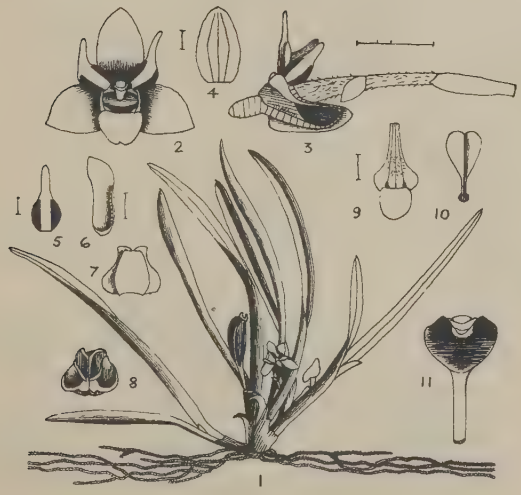

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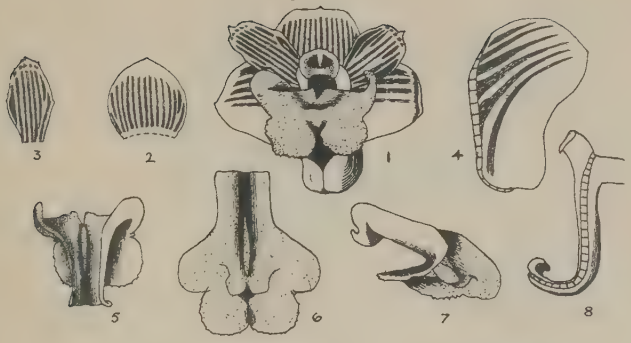

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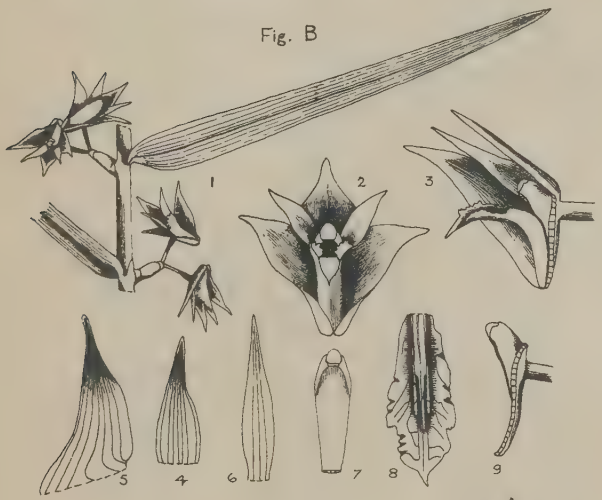

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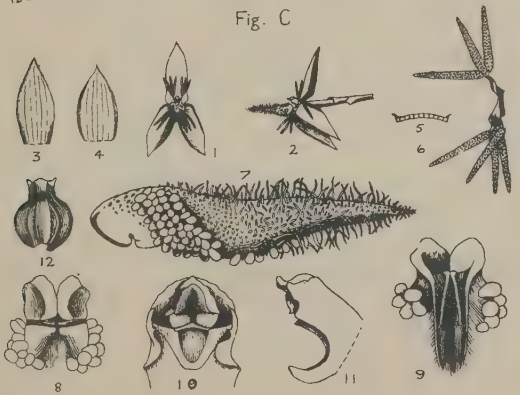

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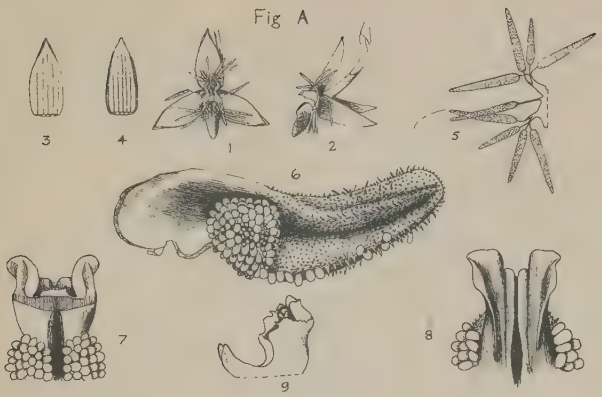

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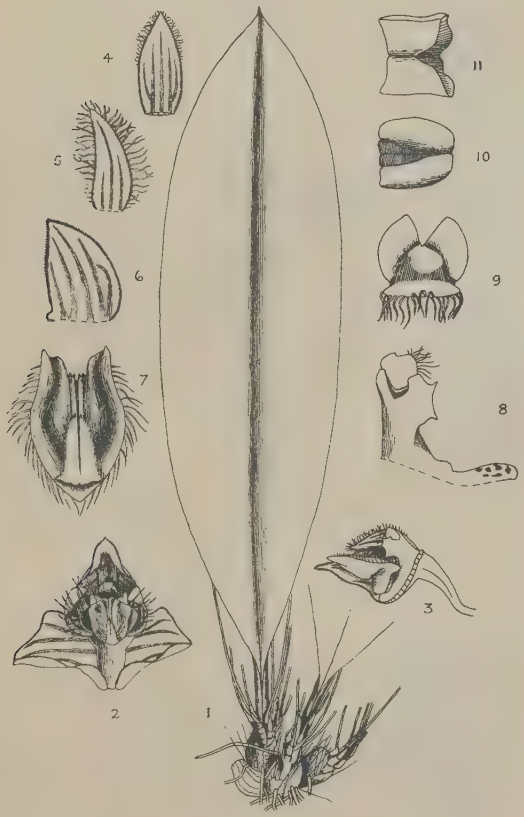

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Fig. A

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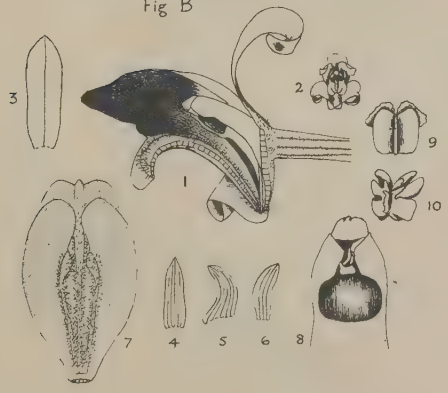

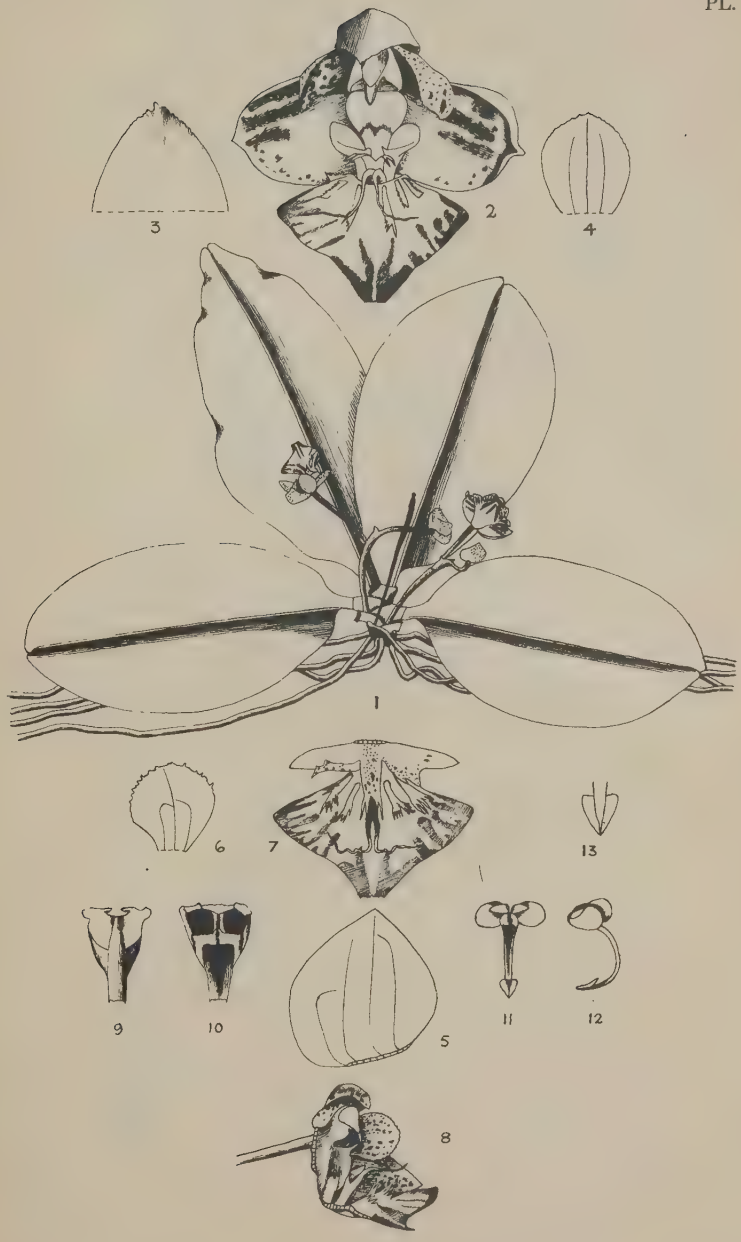
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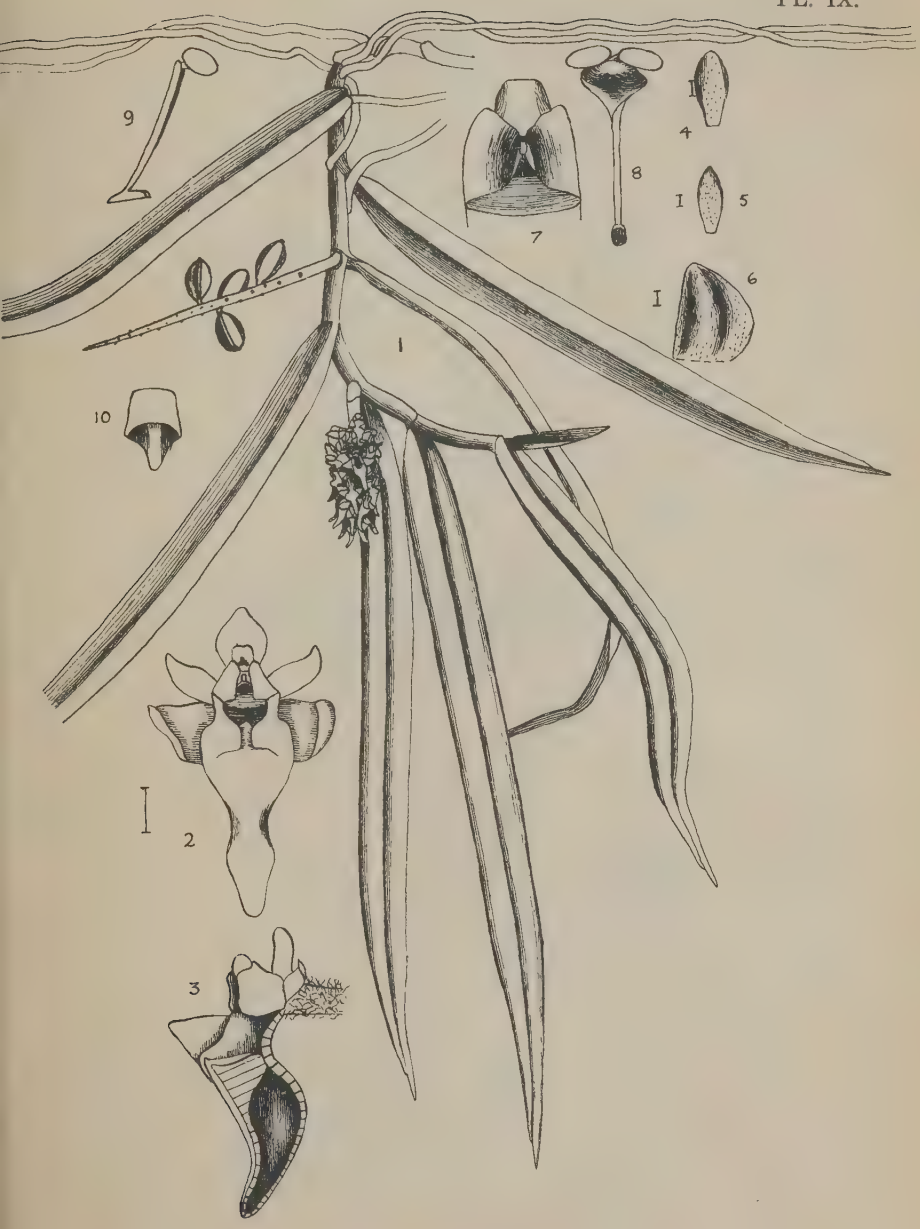
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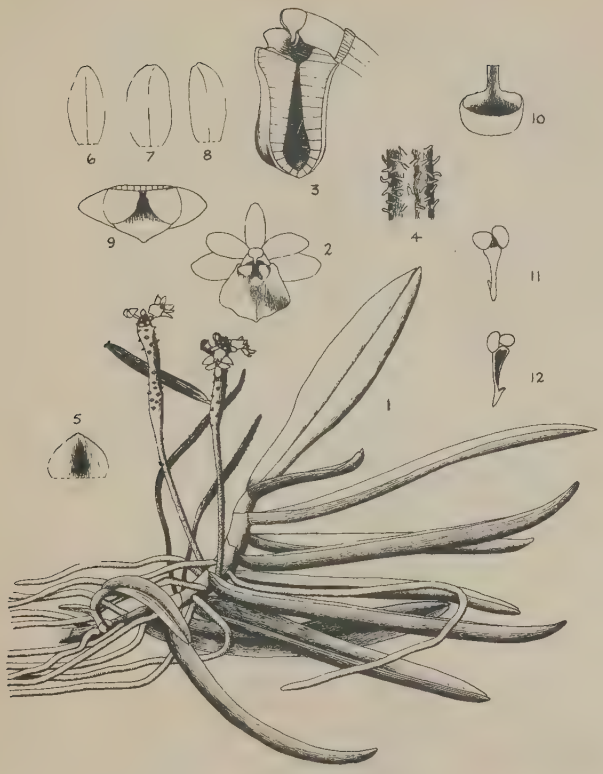

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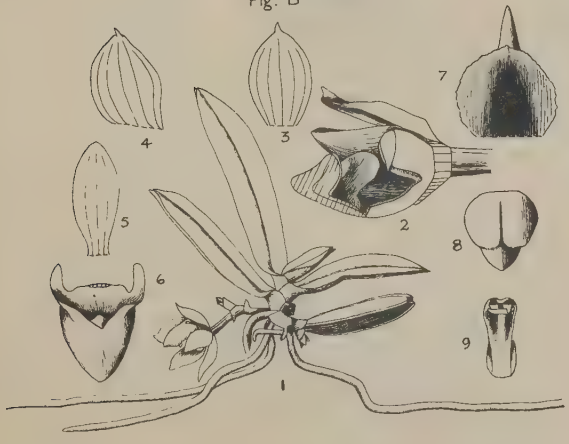

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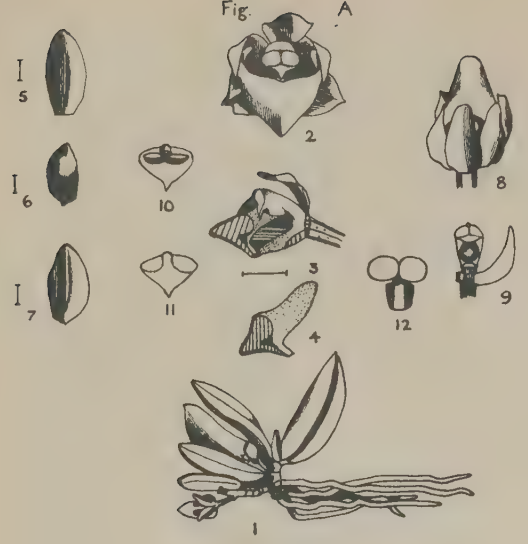

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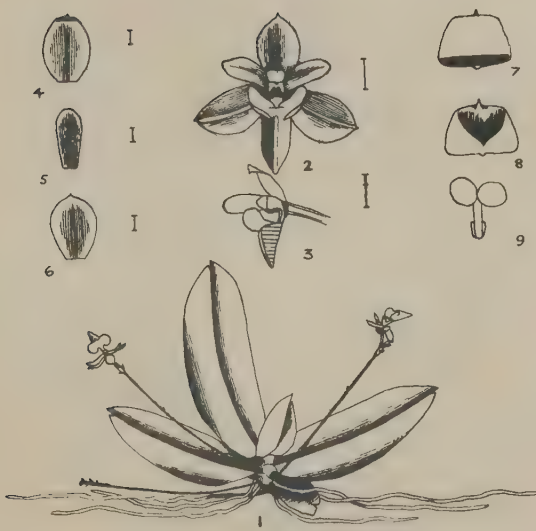

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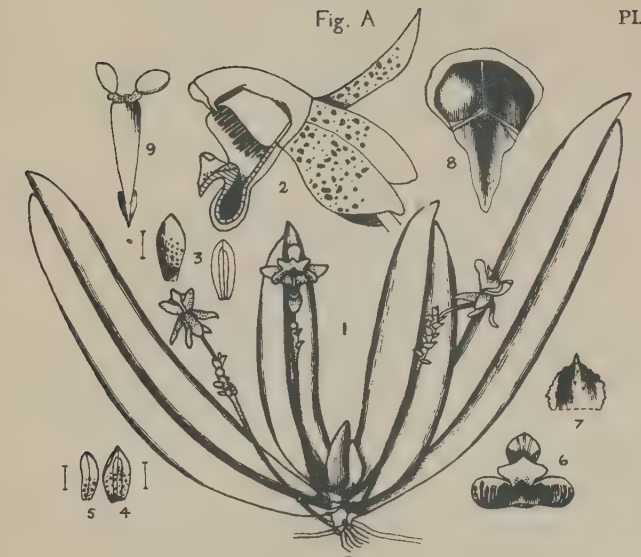

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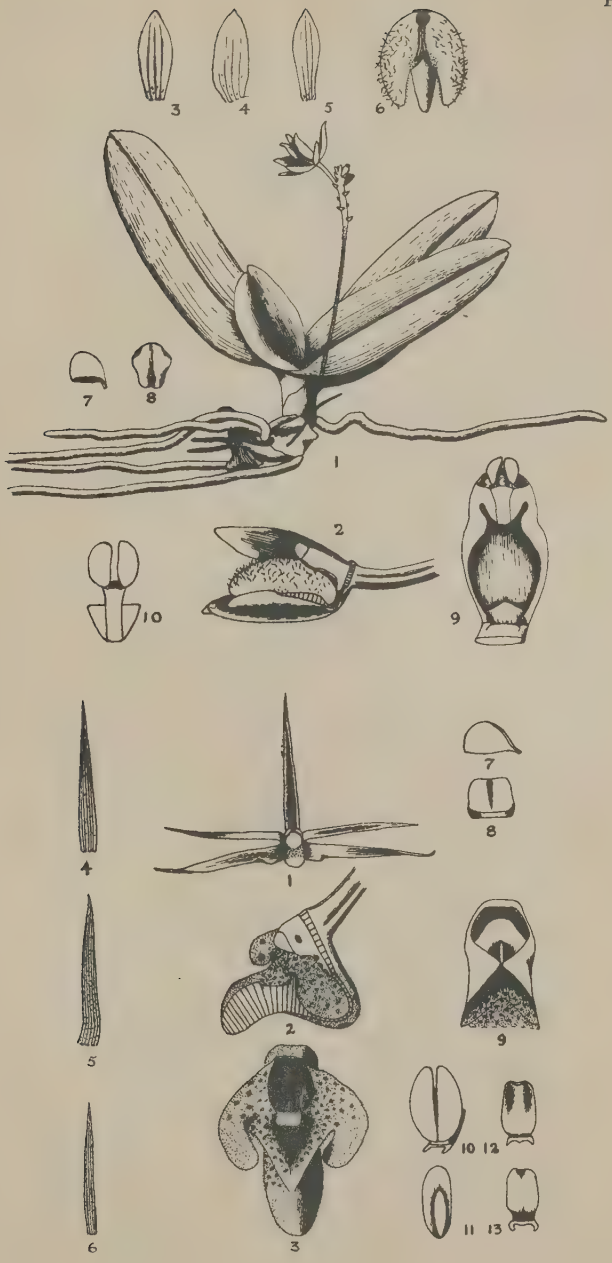
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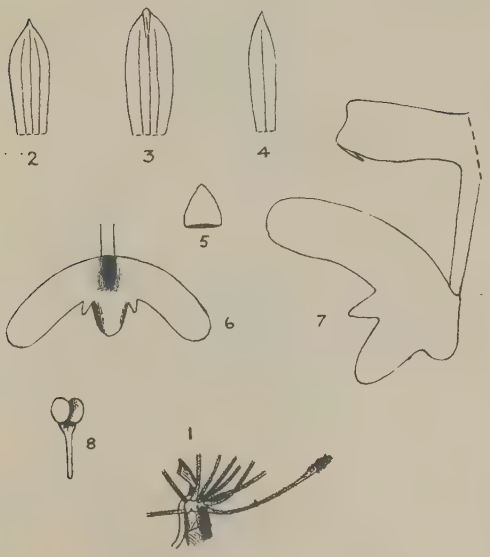
Fig A



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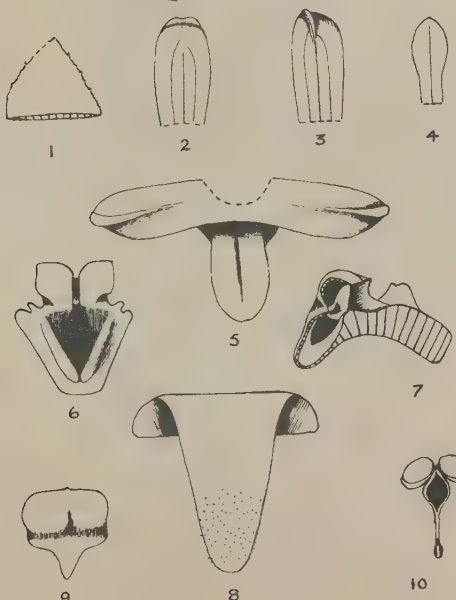

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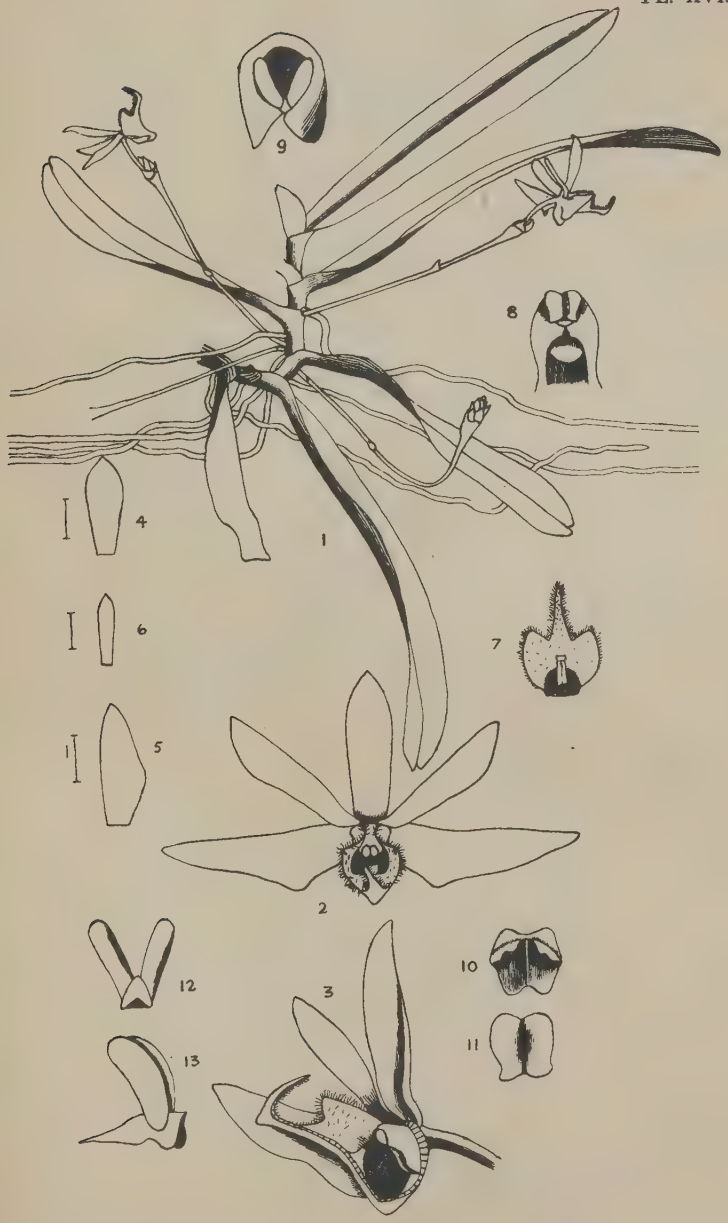
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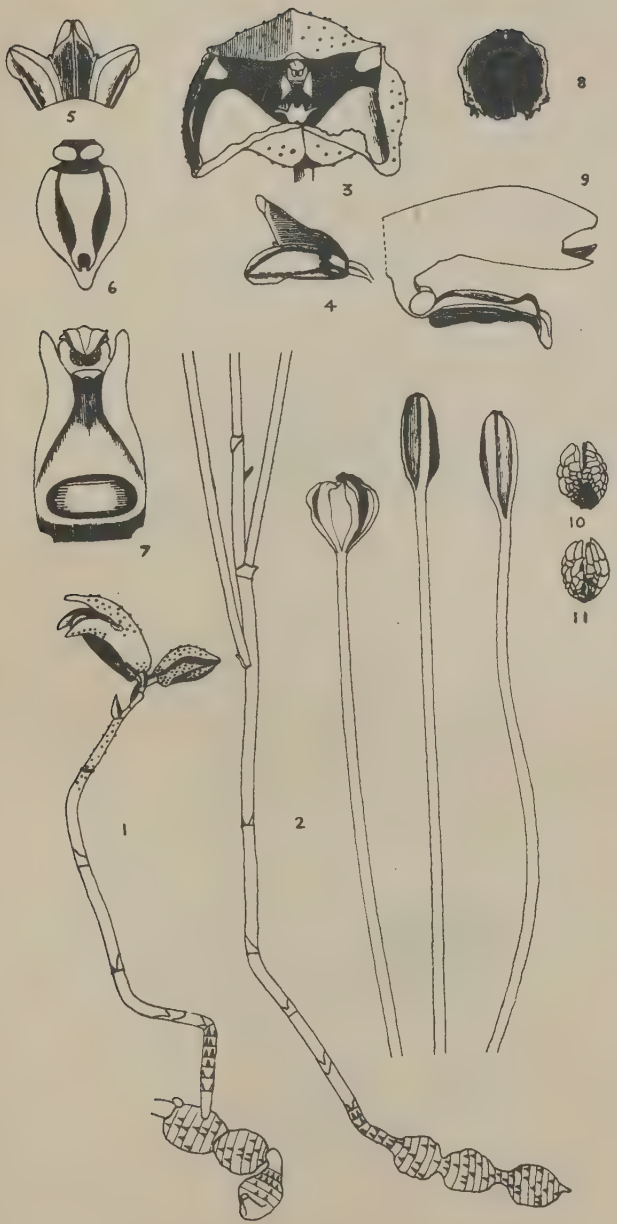
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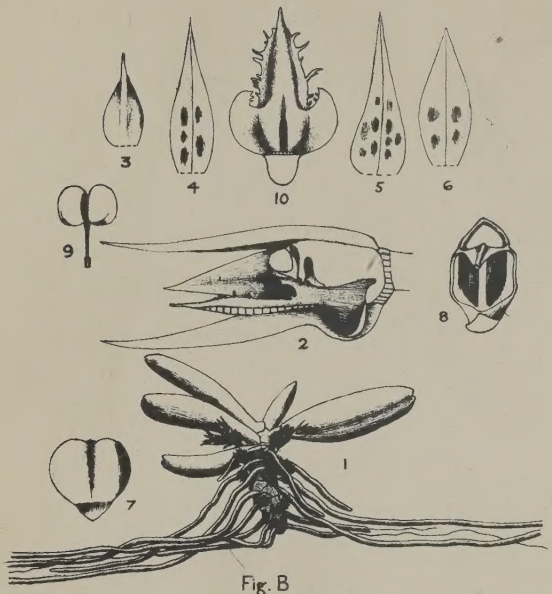

Fig. B